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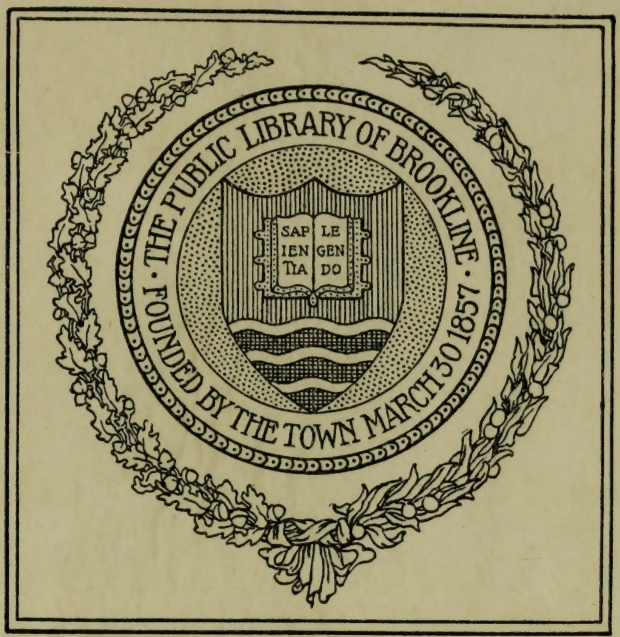

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DOCUMENTS

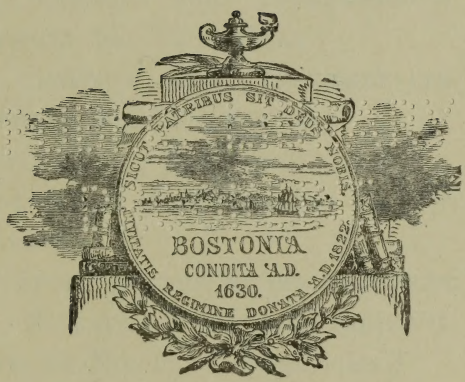
OF THE

SCHOOL COMMITTEE

OF THE

CITY OF BOSTON

FOR THE YEAR 1922



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INDEX TO SCHOOL DOCUMENTS, 1922.

Doc.

1. Annual Report of the Business Agent.
2. A Guide to the Choice of a Secondary School.
3. Reappointments of Teachers and Members of Supervising Staff.
4. Candidates Eligible for Appointment as Teachers.
5. General Science for Intermediate Classes. (Pamphlet No. 8 — A Study of Air and Ventilation.)
6. General Science for Intermediate Classes. (Pamphlet No. 9 — A Study of the Weather.)
7. General Science for Intermediate Classes. (Pamphlet No. 10 — Fire.)
8. General Science for Intermediate Classes. (Pamphlet No. 11 — Heat.)
9. General Science for Intermediate Classes. (Pamphlet No. 12 — Sound.)
10. Special Syllabus — Shopwork.
11. Outline of Work in Geography for Intermediate Classes.
12. Annual Report of the Superintendent.*
13. General Science for Intermediate Classes. (Pamphlet No. 13 — Astronomy.)
14. General Science for Intermediate Classes. (Pamphlet No. 14 — Yeasts, Molds, and Bacteria.)
15. Annual Statistics of the Boston Public Schools.

* Adopted as Annual Report of School Committee.

SCHOOL DOCUMENT NO. 1—1922

SCHOOL COMMITTEE OF THE CITY OF BOSTON

ANNUAL REPORT OF THE BUSINESS AGENT

FOR THE

FINANCIAL YEAR ENDING JANUARY 31, 1922

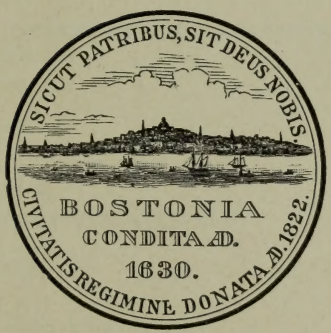
AND

BUDGET

FOR THE

FINANCIAL YEAR ENDING JANUARY 31, 1923

JULY, 1922



CITY OF BOSTON
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FINANCIAL STATEMENT.

On April 18, 1921, the School Committee made the following appropriations on account:

For general school purposes, including Americanization and vocational guidance:	
Salaries of instructors	$4,800,000 00
Salaries of officers	125,000 00
Salaries of janitors	330,000 00
Fuel and light	330,000 00
Supplies and incidentals	350,000 00
Pensions to attendance officers and janitors	5,000 00
Physical education	100,000 00
School physicians and nurses	75,000 00
Pensions to teachers	60,000 00
Extended use of the public schools	30,000 00
Repairs and alterations, protection against fire and fire hazard, and new furniture and furnishings for old buildings, including new lighting fixtures	760,000 00
	$6,965,000 00

On June 6, 1921, the School Committee made the following appropriations on account in addition to those appropriated April 18, 1921:

For general school purposes, including Americanization and vocational guidance:	
Salaries of instructors	$3,121,549 81
Salaries of officers	91,633 71
Salaries of janitors	227,339 51
Fuel and light	150,650 00
Supplies and incidentals	319,466 64
Pensions to attendance officers and janitors	3,066 64
Physical education	70,400 25
School physicians and nurses	62,372 93
Pensions to teachers	46,845 62
Extended use of the public schools	24,290 98
Repairs and alterations, protection against fire and fire hazard, and new furniture and furnishings for old buildings, including new lighting fixtures	216,874 21
Total	$4,334,490 30

The following amounts received during the year were credited to the sub-division item "Salaries of Instructors":

For Conservation of Eyesight, under the provisions of chapter 229, General Acts of 1919	$3,750 00
From Federal Board for Vocational Education, as reimbursement for Rehabilitation Course conducted at Boston Trade School during the summer of 1921	5,875 51

To the item "Pensions to Teachers" was credited the sum of $45,528.89, made available by chapter 289 of the Special Acts of 1916.

To the item "Extended Use of the Public Schools" was credited the sum of $5,400 ($1,400 returned from rotating funds and $4,000 of the excess of income received during the year).

The sums of the foregoing appropriations and credits were as follows:

For general school purposes, including Americanization and vocational guidance:	
Salaries of instructors	$7,931,175 32
Salaries of officers	216,633 71
Salaries of janitors	557,339 51
Fuel and light	480,650 00
Supplies and incidentals	669,466 64
Pensions to attendance officers and janitors	8,066 64
Physical education	170,400 25
School physicians and nurses	137,372 93
Pensions to teachers	152,374 51
Extended use of the public schools	59,690 98
Repairs and alterations, protection against fire and fire hazard, and new furniture and furnishings for old buildings, including new lighting fixtures	976,874 21
Total amount appropriated	$11,360,044 70

During the financial year the following transfers were made by the Business Agent, acting under authority granted him by the School Committee on January 9, 1922:

On January 31, 1922, from "Salaries of Instructors" to "Salaries of Officers"	$9,412 41
On January 31, 1922, from "Salaries of Instructors" to "Salaries of Janitors"	3,923 97
On January 31, 1922, from "Salaries of Instructors" to "Fuel and Light"	12,217 29

With the above additions and transfers, the final total credits for the several items for the year were as follows:

For general school purposes, including Americanization and vocational guidance:	
Salaries of instructors	$7,905,621 65
Salaries of officers	226,046 12
Salaries of janitors	561,263 48
Fuel and light	492,867 29
Supplies and incidentals	669,466 64
Pensions to attendance officers and janitors	8,066 64
Physical education	170,400 25
School physicians and nurses	137,372 93
Pensions to teachers	134,783 68
Payments to permanent pension fund	17,590 83
Extended use of the public schools	59,690 98
Repairs and alterations, protection against fire and fire hazard, and new furniture and furnishings for old buildings, including new lighting fixtures	976,874 21
Total credits	$11,360,044 70

The expenditures were as follows:

For general school purposes, including Americanization and vocational guidance:	
Salaries of instructors	$7,763,333 68
Salaries of officers	226,046 12
Salaries of janitors	561,263 48
Fuel	399,373 61
Light	82,922 82
Power	10,570 86
Supplies and incidentals	651,605 12
Pensions to attendance officers and janitors	7,256 72
Physical education	167,993 40
School physicians and nurses	132,158 23
Pensions to teachers	134,783 68
Payments to permanent pension fund	17,590 83
Extended use of the public schools	59,309 92
Repairs and alterations, protection against fire and fire hazard, and new furniture and furnishings for old buildings, including new lighting fixtures	953,712 71
Total expenditures	$11,167,921 18
Total credits brought down	$11,360,044 70
Total expenditures brought down	11,167,921 18
Balance	$192,123 52

The balance at the end of the year was made up as follows:

For general school purposes, including Americanization and vocational guidance:	
Salaries of instructors	$142,287 97
Salaries of officers	—
Salaries of janitors	—
Fuel and light	—
Supplies and incidentals	17,861 52
Pensions to attendance officers and janitors	809 92
Physical education	2,406 85
School physicians and nurses	5,214 70
Pensions to teachers	—
Extended use of the public schools	381 06
Repairs and alterations, protection against fire and fire hazard, and new furniture and furnishings for old buildings, including new lighting fixtures	23,161 50
Balance	$192,123 52

APPROPRIATION FOR NEW SCHOOL BUILDINGS, LANDS, YARDS, ETC.

On May 16, 1921, and June 6, 1921, the School Committee passed the following orders·

Ordered, That in accordance with the provisions of chapter 206 of the Special Acts of 1919, as amended by chapter 524 of the Acts of 1920, the sum of $2,660,395.57 is hereby appropriated for the purpose of meeting the administration expenses of the Schoolhouse Department, for the additional cost of accommodations previously authorized, for the rent of hired school accommodations, for the grading of school yards, and for additional permanent and portable school accommodations by items as follows: (Passed May 16, 1921).

ADMINISTRATION EXPENSES.

Schoolhouse Department.

Item 1.— Administration expenses, Schoolhouse Department	$40,000 00

ADDITIONAL PROVISION TO MEET COST OF ACCOMMODATIONS PREVIOUSLY AUTHORIZED.

Item 2.— Bowdoin District, West End: Grading of extension of yard of Bowdoin School (Item 7, 1920)	$5,000 00
Item 3.— Administration Building	75,000 00

HIRED ACCOMMODATIONS.

Item 4.— Rent of hired accommodations $46,000 00

Item 5.—

ADDITIONAL SCHOOL ACCOMMODATIONS.

Item 6.— Prince District, city proper: Construction of eight-room building, Grades I. to VI. (Item 17, 1920) . 25,645 57

Item 7.— Washington-Allston District, Brighton: Construction of twelve-room building, Grades I. to VI. (Item 18, 1920) 270,000 00

Item 8.— Theodore Lyman District, East Boston: Construction of eight-room building, Grades I. to VI. (Item 19, 1920) 135,000 00

Item 9.— Dearborn District, Roxbury: Extension of yard on Ambrose street (Item 22, 1920) 100 00

Item 10.— Emerson District, East Boston: Construction of extension to Emerson building, six intermediate class rooms, four rooms for manual training and domestic science, and one principal's office (Item 21, 1920) 118,000 00

Item 11.— Bennett District, Brighton, Mary Lyon School building: Construction of two-room addition, convertible into hall (Item 23, 1920) 37,000 00

Item 12.— Henry L. Pierce District, Dorchester: Construction of new high school building (Item 24, 1920) . . . 1,120,000 00

Item 13.— Charles Sumner District, West Roxbury: Construction of intermediate school, twelve class rooms, combination hall and gymnasium, one or two combination laboratories, four rooms for manual training and domestic science (Item 20, 1920) 305,000 00

Item 14.— Henry L. Pierce District, Dorchester: Construction of four-room building to connect with Bailey street building 47,500 00

Item 15.— Edmund P. Tileston District, Dorchester: Construction of four-room building, Grades I. to III. and kindergarten (Item 31, 1920) 42,500 00

Item 16.— John Marshall District, Dorchester: Special class center; land, building and alterations 50,000 00

Item 17.— Wells District, city proper: Extension of yard . 5,000 00

Item 18.— Elihu Greenwood District, Hyde Park: Extension of yard 3,500 00

Item 19.—

Item 20.—

Item 21.— Julia Ward Howe District, Roxbury: Plans and construction of additional accommodations on Julia Ward Howe lot; four rooms and hall (Item 35, 1920.) . . . 103,000 00

Item 22.— Robert G. Shaw District, West Roxbury: Land, plans and construction of four-room building, Grades I. to VI., near Washington street and High View avenue . . $53,500 00

Item 23.— Bennett District, Brighton: Plans and construction of two-room addition at Oak square 23,750 00

Item 24.— William Lloyd Garrison District, Roxbury: Construction of hall (Item 29, 1920.) 66,000 00

Item 25.— Edward Everett District, Dorchester: Construction of four-room addition to John Lothrop Motley School building (Item 37, 1920.) 88,900 00

Ordered, That in accordance with the provisions of chapter 206 of the Special Acts of 1919, as amended by chapter 524 of the Acts of 1920, the sum of $132,854.12 is hereby appropriated for the purpose of meeting the administration expenses of the Schoolhouse Department, for the additional cost of accommodations previously authorized, for the rent of hired school accommodations, for the grading of school yards, and for additional permanent and portable school accommodations by items as follows: (Passed June 6, 1921.)

ADDITIONAL PORTABLE BUILDINGS.

Item 5.— Additional portable buildings $132,854 12

The sums thus appropriated for new buildings, lands, yards, etc., totaling $2,793,249.69, form a part of the tax levy for the year.

This money is expended under the direction of the Schoolhouse Commission and is accounted for by them in detail in their report. It has not been considered wise to introduce such matter into this report, not only for the reason that it would be a duplication of information in the report of the commission, but because for purposes of comparison with expenditures of other years or of other cities it appears better to separate statements of maintenance and operating expenses from construction accounts.

PHYSICAL EDUCATION.

The amount of money available for physical education under chapter 206 of the Special Acts of 1919 and chapter 249 of the Special Acts of 1919 was $167,900.25. To this sum was added the estimated income for the year amounting to $2,500.

The total amount appropriated for this purpose was, therefore, as follows:

Appropriation from tax levy for 1921–22	$167,900 25
Estimated income	2,500 00
Total amount appropriated	$170,400 25

The expenditures were as follows:

Salaries charged to office of Department of Physical Training	$7,148 24	
Salaries, schools	76,500 21	
Salaries of teachers, playgrounds *	45,839 85	
Salaries of janitors, playgrounds	5,272 54	
Supplies, equipment and incidentals for schools and playgrounds, etc.	33,232 56	
Total expenditures		$167,993 40
Balance		$2,406 85

TRIAL BALANCE — PHYSICAL EDUCATION APPROPRIATION.

Dr.

Appropriation, physical education	$170,400 25
Supplies overcharged to schools	506 30
Supplies not charged to physical education appropriation	1,466 96
Stock inventory, December 1, 1920	3,846 69
	$176,220 20

Cr.

Salaries charged to office of Department of Physical Training	$7,148 24
Salaries, schools	76,500 21
Salaries, playgrounds	45,839 85
Salaries, playground janitors	5,272 54
Supplies, schools and other activities	21,432 92
Supplies, playgrounds	8,954 00
Supplies, office of Department of Physical Training	5,041 31
Supplies, undercharged to schools	—
Stock inventory, December 1, 1921	3,624 28
Balance unexpended	2,406 85
	$176,220 20

* This cost of playgrounds is exclusive of the salaries of any part of the supervising staff who were in any way connected with the playgrounds. The complete cost of playgrounds is shown later on in this report under "Cost of Playgrounds."

SCHOOL PHYSICIANS AND NURSES.

The amount of money available for school physicians and nurses under chapter 206 of the Special Acts of 1919, and chapter 249 of the Special Acts of 1919 was $137,372.93.

Appropriation for 1920–22	$137,372 93

The expenditures were as follows:

Salaries:		
Office of Department of Medical Inspection,	$12,305 30	
School physicians, schools	43,698 91	
Nurses, schools	71,495 51	
Supplies for school physicians and nurses	4,658 51	
Total expenditures		$132,158 23
Balance		$5,214 70

TRIAL BALANCE — APPROPRIATION, SCHOOL PHYSICIANS AND NURSES.

Dr.

Appropriation	$137,372 93
Supplies not charged to appropriation for school physicians and nurses	256 97
Supplies overcharged to schools	54 18
Stock inventory, December 1, 1920	2,205 22
	$139,889 30

Cr.

Salaries charged to office of Department of Medical Inspection	$12,305 30
Salaries, school physicians, schools	43,698 91
Salaries, school nurses, schools	71,495 51
Supplies, schools and other activities	2,213 58
Supplies, office of Department of Medical Inspection	2,750 77
Supplies undercharged to schools	—
Stock inventory, December 1, 1921	2,210 53
Balance unexpended	5,214 70
	$139,889 30

EXTENDED USE OF THE PUBLIC SCHOOLS.

The amount of money available for extended use of the public schools under chapter 206 of the Special Acts of 1919 and chapter 641 of the Acts of 1920, was $45,790.98. To this sum was added the estimated income for the year amounting to $8,500.

During the year $1,400 returned from rotating funds and $4,000 of the excess of income were also added. The sum of $3,067 30, representing the excess cost of fuel and light, was not charged against the appropriation for extended use of the public schools.

The total amount available for this purpose was, therefore, as follows:

Appropriation from tax levy 1921–22	$45,790 98
Estimated income added	8,500 00
Returned from rotating funds	1,400 00
Excess of income appropriated	4,000 00
Exceas cost of fuel and light not charged to appropriation,	3,067 30
Total	$62,758 28

The expenditures were as follows:

Salaries, office of Directors	$4,548 18	
Salaries, school centers	25,538 00	
Salaries, use of school accommodations	1,050 50	
Salaries, janitors, school centers	8,819 32	
Salaries, janitors, use of school accommodations	6,254 39	
Supplies, equipment and incidentals for centers, etc. (including excess cost of fuel and light, viz., $3,067 30)	16,166 83	
Total expenditures		$62,377 22
Balance		$381 06

TRIAL BALANCE — APPROPRIATION, EXTENDED USE OF THE PUBLIC SCHOOLS.

Dr.

Appropriation	$62,758 28
Supplies overcharged	37 75
Supplies not charged to appropriation for extended use of the public schools	111 07
Stock inventory, December 1, 1920	103 65
	$63,010 75

Cr.

Salaries, office of Directors	$4,548 18
Salaries, school centers	25,538 00
Salaries, use of school accommodations	1,050 50
Carried forward	$31,136 68

Brought forward	$31,136 68
Salaries, janitors, school centers	8,819 32
Salaries, janitors, use of school accommodations	6,254 39
Supplies and incidentals, office	510 28
Supplies and incidentals, school centers	12,793 51
Supplies and incidentals, use of school accommodations	2,852 61
Supplies, undercharged to schools	—
Stock inventory, December 1, 1921	262 90
Balance unexpended	381 06
	$63,010 75

EXPENDITURES BY SCHOOLHOUSE COMMISSION.

The appropriation made for "Repairs and Alterations, protection against fire and fire hazards, and new furniture and furnishings for old buildings, including new lighting fixtures" ($976,874.21), was expended under the direction of the Schoolhouse Commission as follows:

REPAIRS AND ALTERATIONS.

Carpentry:	
Repairs	$93,314 77
Alterations	25,745 50
New floors	599 76
Hardware	—
Furniture and Equipment:	
New furniture	167,657 45
Repairs to furniture	45,326 77
New curtains	5,913 80
Curtain repairs	6,858 37
New clocks	179 00
Clock repairs	1,762 76
Electric clock maintenance	2,853 25
Electric clock installation	—
Industrial apparatus installation	1,381 02
Industrial apparatus maintenance	728 35
Manual training and prevocational installation	2,629 33
Manual training and prevocational maintenance	311 27
Reflectoscope maintenance	838 55
Reflectoscope installation	338 25
Vacuum cleaning maintenance	108 85
Vacuum cleaning installation	—
Rubber treads and matting	3,194 12
Gymnasium apparatus	—
Carried forward	$359,741 17

Brought forward	$359,741 17	
Blackboards:		
New	1,458 31	
Repairs	11,059 84	
Plumbing	109,881 15	
Roofing	53,532 07	
Painting	42,244 38	
Glazing	15,483 65	
Heating:		
Repairs	91,683 61	
Ventilation	300 19	
Care of Grounds:		
Gypsy moths	483 49	
Planting	2,360 28	
Masonry:		
Repairs	47,843 28	
Plastering	5,694 83	
Paving	20,836 00	
Catch-basins	8,003 64	
Asphalt and concrete	2,941 40	
Waterproofing	—	
Grading	3,097 20	
Locks and Bells:		
Bells and telephone installation	1,342 94	
Bells and telephone maintenance	7,788 22	
Locksmithing	8,284 43	
Electric and Gas Work:		
Electric light installation	39,943 56	
Electric light maintenance	9,685 96	
Gas appliance installation	2,017 83	
Gas appliance maintenance	2,667 84	
Fire Protection:		
Fire alarm installation	2,167 00	
Fire alarm maintenance	4,308 23	
Fire escapes, new	2,560 67	
Fire escapes, repairs	4,022 15	
Fire extinguishers	1,000 47	
Fire protection	6,339 35	
Miscellaneous:		
Flagstaffs	1,631 11	
Iron and wire work	11,335 72	
Custodian's supplies	1,154 70	
Care and cleaning	1,696 25	
Teaming	4,100 44	
Motors and engines	2,611 26	
		$891,302 62

ADMINISTRATION EXPENSES.

Salaries, commissioners and clerks	$10,053 52	
Salaries, inspectors	40,934 05	
Carried forward	$50,987 57	$891,302 62

Brought forward	$50,987 57	$891,302 62
Storehouse	2,479 69	
Electric lighting of offices	—	
Postage	270 00	
Printing	1,195 13	
Stationery	948 63	
Advertising	312 10	
Telephone	67 19	
Automobile expenses	1,552 33	
Furniture	2,213 50	
Car fares, traveling expenses	2,233 41	
Boiler insurance	94 04	
Sundries	25 50	
Subscription	12 00	
Teaming	19 00	
Expert services	—	
		62,410 09
Total repairs and administration expenses		$953,712 71

SUMMARY.

Appropriation:		
Repairs and alterations, protection against fire and fire hazard, and new furniture and furnishings for old buildings, including new lighting fixtures		$976,874 21
Expenditures.		
Repairs and equipment	$891,302 62	
Administration expenses	62,410 09	
		953,712 71
Balance		$23,161 50

RENTS AND TAXES.

Under chapter 206 of the Special Acts of 1919 rents and taxes are charged against the appropriation for new school buildings, lands, yards and furnishings.

In consequence, while they are set forth below, it should be distinctly understood that they are no longer to be included in the accounts of maintenance costs.

Berkeley street, 142	$275 32
Boylston street, 48	1,167 50
Brighton avenue, Baptist Church	600 00
Codman Square Theater	150 00
Eliot street, Jamaica Plain (Trustees Building)	1,000 00
Carried forward	$3,192 82

Brought forward	$3,192 82	
Everett Square Theater	25 00	
Franklin street, 149	220 00	
Franklin Union	8,565 00	
Hanson street, 1	864 00	
Hyde Park Gymnasium, Y. M. C. A.	1,200 00	
La Grange street, 25	5,884 40	
Moon street	14,040 00	
National Theater	200 00	
North Bennet street, 39	4,645 00	
Saratoga street, 66	780 00	
School street, Roxbury	192 10	
Tileston street, 52	1,200 00	
Tremont street, 218	5,916 00	
Tremont street, 278B	1,020 00	
Tremont Temple	160 00	
Unitarian Church of Roslindale	840 00	
Upham Memorial Church	780 00	
Walnut avenue and Walnut park	1,500 00	
Total rents and taxes		$51,224 32

INCOME.

The income for the financial year was as follows:

Tuition of non-resident pupils:		
Normal School	$2,086 00	
Latin and high schools	10,984 64	
Elementary schools	354 34	
Boston Clerical School	481 00	
Trade School for Girls, day and extension classes	6,059 10	
Boston Trade School	16,042 27	
Boston Trade School, Evening Classes	480 07	
Continuation School, Voluntary	90 00	
Day School for Immigrants	11 20	
Mechanic Arts Training School	905 96	
Evening high schools	17 00	
Speech improvement classes	26 80	
Evening elementary schools	38 00	
Summer Review elementary schools	10 00	
Summer Review High School	—	
State wards (from the Commonwealth)	2,461 00	
Tuition of deaf mutes (from the Commonwealth)	44,896 07	
		$84,943 45
Salaries of instructors overpaid refunded		3,131 65
Smith Fund		324 50
Stoughton Fund		212 00
Carried forward		$88,611 60

Brought forward		$88,611 60
Aid from the Commonwealth for industrial education:		
Trade School for Girls:		
One half the net cost of maintenance for the period September 1, 1919, to August 31, 1920	$30,702 13	
Boston Trade School:		
One half the net cost of maintenance for the period September 1, 1919, to August 31, 1920	28,874 66	
Boston Trade School, Evening Classes:		
One half the net cost of maintenance for the period September 1, 1919, to August 31, 1920	5,079 35	
Continuation School, Compulsory:		
One half the net cost of maintenance for the period September 1, 1919, to August 31, 1920	56,729 05	
Charlestown High School, Co-operative Course:		
One half the net cost of maintenance for the period September 1, 1919, to August 31, 1920	4,245 65	
Hyde Park High School Co-operative Course:		
One half the net cost of maintenance for the period September 1, 1919, to August 31, 1920	6,078 32	
High School of Practical Arts, Household Arts Department:		
One half the net cost of maintenance for the period January 1, 1920, to August 31, 1920	17,360 26	
West Roxbury High School, Vocational Agricultural Department:		
One half the net cost of maintenance for the period September 1, 1919, to August 31, 1920	1,248 46	
Evening Practical Arts Courses:		
One half the net cost of maintenance for the period September 1, 1919, to August 31, 1920	5,584 84	
Afternoon Practical Arts Classes:		
One half the net cost of maintenance for the period September 1, 1919, to August 31, 1920	38 25	
Summer Practical Arts Classes:		
One half the net cost of maintenance for the period September 1, 1919, to August 31, 1920	392 40	
		156,333 37
Carried forward		$244,944 97

Brought forward		$244,944 97
One half tuition charges paid for Boston pupils attending state-aided schools in other cities and towns (from the Commonwealth)		139 05
Traveling expenses of deaf mutes (from the Commonwealth),		3,902 02
Reimbursement from the Commonwealth, promotion of Americanization (chapter 295, General Acts of 1919),		19,865 70
Smith-Hughes Fund, allotment		42,308 33
Light at polling places (from Election Department)		146 16
Sale of badges to licensed minors		401 00
Sale of books and supplies		3,361 32
Sale of car tickets		1,028 90
Restitution for stolen typewriters, order of court		22 50
Mechanic Arts High School, work done for Schoolhouse Commission		115 00
Mechanic Arts High School, sale of materials, etc.		279 74
Sale of manual arts materials (elementary schools)		2,869 49
Manual arts, work done for Schoolhouse Commission		180 26
Incidentals		156 53
Trade School for Girls:		
Sale of products	$13,511 41	
Interest on deposit	39 26	
Telephone charges	9 30	
		13,559 97
Boston Trade School:		
Sale of products	$2,660 76	
Work done for Schoolhouse Commission	836 57	
Supplies purchased for Federal students	523 03	
Telephone charges	—	
		4,020 36
Boston Trade School, Evening Classes, sale of products		—
Continuation School, Compulsory:		
Sale of products	$2,942 28	
Work done for Schoolhouse Commission	276 64	
Telephone charges	—	
		3,218 92
Telephone charges		354 00
Forfeited advance payments:		
Evening high schools	$2,736 00	
Evening elementary schools	2,075 00	
Boston Trade School, evening classes	823 00	
Trade School for Girls, Extension Classes (evening)	—	
Interest	347 27	
		5,981 27
Department of Physical Training, returns, etc., from games,		3,588 28
Extended Use of the Public Schools, receipts from school centers and from use of school accommodations		9,999 60
Sale of second-hand furniture, etc. (Schoolhouse Commission)		1,180 30
Carried forward		$361,623 67

Brought forward		$361,623 67
Dog licenses	$23,902 00	
Less damages by dogs	6,752 00	
		17,149 00
Total income *		$378,772 67

INCOME FROM TRUST FUNDS.

Bowdoin Dorchester School Fund	$191 26
Eastburn School Fund	435 00
Franklin Medal Fund	35 00
Gibson School Fund	3,318 86
Horace Mann School Funds	307 00
Peter P. F. Degrand School Fund	1,174 26
Teachers' Waterston Fund	144 00
Charlestown School Fund	222 76
Comins School Library Fund	17 50
Latin School Prize Fund	36 76
Lawrence High School Fund	70 00
Lawrence Latin School Fund	70 00
Milmore Brimmer School Fund	20 00
Norcross School Library Fund	17 50
Sherwin School Graduates Fund	20 00
Devens Infant School Fund	40 00
Webb Franklin School Fund	70 00
Smith Fund †	324 50
Stoughton Fund †	212 00
	$6,726 40

The above total of $6,726.40 from the income of the above funds is available for and limited to expenditures under the provisions of these funds.

AID FROM THE COMMONWEALTH FOR VOCATIONAL EDUCATION.

Under the provisions of chapter 471 of the Acts of 1911, chapter 106 of the Acts of 1912, chapter 805 of the Acts of 1913, and chapter 174 of the Acts of 1914, the Commonwealth has paid over into the city treasury during the past financial year the sum of $156,333.37.

This sum is one half the net cost of maintenance of schools and classes established with the approval of the Department of Education.

* Exclusive of items credited to appropriations. (See "Financial Statement.")

† Included in general income of School Committee. (See income statement preceding).

Trade School for Girls:	
From September 1, 1919, to August 31, 1920	$30,702 13
Boston Trade School:	
From September 1, 1919, to August 31, 1920	28,874 66
Boston Trade School, Evening Classes:	
From September 1, 1919, to August 31, 1920	5,079 35
Continuation School, Compulsory:	
From September 1, 1919, to August 31, 1920	56,729 05
Charlestown High Co-operative Course:	
From September 1, 1919, to August 31, 1920	4,245 65
Hyde Park High Co-operative Course:	
From September 1, 1919, to August 31, 1920	6,078 32
High School of Practical Arts; Household Arts Department:	
From January 1, 1920, to August 31, 1920	17,360 26
West Roxbury High, Vocational Agricultural Department:	
From September 1, 1919, to August 31, 1920	1,248 46
Evening Practical Arts Courses (Evening Elementary Schools):	
From September 1, 1919, to August 31, 1920	5,584 84
Afternoon Practical Arts Classes:	
From September 1, 1919, to August 31, 1920	38 25
Summer Practical Arts Classes:	
From September 1, 1919, to August 31, 1920	392 40
Total	$156,333 37

The Commonwealth does not bear any part of the cost of the buildings or their original equipment. At the present time there are fourteen activities established with the approval of the Department of Education which come under the provisions of the above legislation, viz., Trade School for Girls (including day and extension classes), Boston Trade School, Boston Trade School Evening Classes, Continuation School (Household Arts Class), Compulsory Continuation School, Evening Practical Arts Courses, Afternoon Practical Arts Classes, Summer Practical Arts Classes, High School of Practical Arts (Household Arts Department), Hyde Park High School, Co-operative Course, and the Charlestown High School, Co-operative Course, Dorchester High School, Co-operative Course, West Roxbury High School, Vocational Agricultural Department, Summer Practical Arts Courses (canning) and Unit Agricultural Courses.

NET EXPENDITURES.

Total expenditures (exclusive of new buildings, lands, yards, etc.)	$11,167,921 18
Total income	378,772 67
Net expenditures *	$10,789,148 51
Add expenditures for new schoolhouses, additions, etc. (by the Schoolhouse Commission)†	1,651,322 69
Total net expenditures‡	$12,440,471 20

COMPARISON OF EXPENDITURES.

The following statement shows the expenditures for the financial years 1921–22 and 1920–21, exclusive of lands and buildings, with the increases and decreases in the several items:

	1921–22.	1920–21.	Increases, 1921–22.
For general school purposes, including Americanization and Vocational Guidance:			
Salaries of instructors	$7,763,333 68	$6,643,665 03	$1,119,668 65
Salaries of officers	226,046 12	206,556 85	19,489 27
Salaries of custodians	561,263 48	545,273 11	15,990 37
Fuel and light	492,867 29	564,168 36	71,301 07[1]
Supplies and incidentals	651,605 12	488,881 68	163,723 44
Pensions to attendance officers and custodians.	7,256 72	7,799 63	542 91[1]
Physical education	167,993 40	148,569 60	19,423 80
School physicians and nurses	132,158 23	113,643 82	18,514 41
Pensions to teachers	134,783 68	127,567 79	7,215 89
Payments to Permanent Pension Fund,	17,590 83	10,450 65	7,140 18
Extended use of the public schools	59,309 92	29,800 21	29,509 71
Repairs and alterations, protection against fire and fire hazards, and new furniture and furnishings for old buildings, including new lighting fixtures.	953,712 71	1,011,551 51	57,838 80[1]
Totals	$11,167,921 18	$9,897,928 24	$1,269,992 94

[1] Decrease.

PENSIONS TO TEACHERS.

In 1908 and each year thereafter up to and including 1914, the School Committee, under the authority of

* That part of the total expenditures coming from the School Committee share of the local tax levy.

† Partly from loans and partly from the tax levy. For details see the report of the Schoolhouse Commission.

‡ Exclusive of interest and sinking fund.

section 4 of chapter 589 of the Acts of 1908, appropriated for the purpose of paying pensions and making payments to the Permanent Pension Fund the sum of five cents on each $1,000 of the valuation of the city, upon which appropriations by the City Council are based.

During the year 1913–14 the sum so appropriated was found insufficient to pay pensions for the year, and the additional sum of $880.43 was transferred from the accrued interest of the Permanent Pension Fund.

In 1914–15 a transfer of $7,628.60 from the same fund was found to be necessary for the same reason.

Chapter 304 of the Acts of 1915 has made available from the tax levy seven cents on each $1,000 of the valuation of the city, which, during the year 1918–19, amounted to $107,911.83. This sum was found insufficient and it became necessary to transfer $2,870.55 from the accrued interest of the Permanent Pension Fund, making a total of $110,782.38 expended for the purpose during that year.

Chapter 289 of the Special Acts of 1916 provided that "The sums payable by the Commonwealth to the City of Boston, under the provisions of section 13 of chapter 832 of the Acts of the year 1913, being an act to establish a retirement system for public school teachers, as reimbursement for certain pensions paid by the city to retired school teachers, shall be put into the current pension fund held by the School Committee of the City of Boston and used in accordance with the provisions of chapter 589 of the Acts of the year 1908." Under this act the sum of $45,528.89 paid over by the Commonwealth to the city became available during the financial year and was added to the appropriation from the tax levy for paying pensions to retired teachers.

Since the enactment of chapter 589 of the Acts of 1908, payments as pensions and to the Permanent Pension Fund have been distributed as shown in the following table:

Financial Year.	Pensions to Retired Teachers from the Tax Levy.	Payments to the Permanent Pension Fund from the Tax Levy.	Payments to the Permanent Pension Fund from the Fund paid over by the Commonwealth.*
1908–09	$1,678 50	—	
1909–10	8,075 12	$119,181 08	
1910–11	26,247 88	39,946 77	
1911–12	55,350 31	12,420 53	
1912–13	64,510 76	5,681 66	
1913–14	† 72,893 19	—	
1914–15	‡ 81,482 96	—	
1915–16	90,011 87	15,741 25	
1916–17	96,029 97	11,631 48	
1917–18	104,347 95	5,432 37	$24,321 96
1918–19	§ 110,782 38	—	22,490 03
1919–20	‖ 116,392 59	—	18,175 03
1920–21	¶ 127,567 79	—	10,450 65
1921–22	** 134,783 68	—	17,590 83
Totals	$1,090,154 95	$210,035 14	$93,028 50
Grand total, twelve years			$1,393,218 59

* Under chapter 289, Special Acts of 1916.
† Including $880.43 transferred from the accrued interest of the Permanent Pension Fund.
‡ Including $7,628.60 transferred from the accrued interest of the Permanent Pension Fund.
§ Including $2,870.55 transferred from the accrued interest of the Permanent Pension Fund.
‖ Including $10,066.86 of the sum ($28,241.89) paid over by the Commonwealth.
¶ Including $23,243.77 of the sum ($33,694.42) paid over by the Commonwealth.
** Including $27,938.06 of the sum ($45,528.89) paid over by the Commonwealth.

DISTRIBUTION OF EXPENDITURES.

The distribution of the total expenditures, exclusive of lands and buildings, pensions, repairs, alterations and rents, in percentage of the whole sum, is as follows:

Salaries of instructors	$7,763,333 68	77.2
Salaries of officers	226,046 12	2.2
Salaries of janitors	561,263 48	5.6
Fuel and light	492,867 29	4.9
Supplies and incidentals	651,605 12	6.5
Physical education	167,993 40	1.7
School physicians and nurses	132,158 23	1.3
Extended use of the public schools	59,309 92	0.6
Total	$10,054,577 24	100.0

SUPPLIES AND INCIDENTALS.

The expenditures for the year under the appropriation for Supplies and Incidentals were as follows:

Text-books	$127,778 78
Supplementary books	34,712 47
Reference books	5,911 04
Rebinding books	2,308 65
Music sheets	667 05
Globes	180 00
Maps	5,371 98
Charts	723 43
Pianos	14,494 00
Repairs, regulation, and reconstruction of pianos	1,477 25
Other musical instruments (new)	2,671 93
Piano covers, etc	32 50
Piano tuning	2,134 25
Moving pianos	358 10
Manual training supplies (high and elementary schools)	55,038 70
Drawing supplies (high and elementary schools)	32,133 10
Science apparatus and supplies	4,222 17
Laboratory assistance, perishable supplies and incidentals	1,278 97
Commercial supplies	5,650 13
Commercial machines and typewriters (including rentals and repairs)	40,117 68
Kindergarten supplies	11,209 78
Sewing supplies and equipment	5,238 03
Cooking supplies and equipment	13,790 71
Supplies for Busy Work	15,169 92
Penmanship supplies (high and elementary schools)	747 25
Supplies and equipment for Compulsory Continuation School,	7,298 33
Trade School for Girls, supplies and equipment	8,951 21
Boston Trade School, supplies and equipment	18,497 08
Evening Practical Arts Courses	502 85
Supplies for general educational purposes	13,968 81
Printing and printing stock	32,495 02
Advertising	446 27
Records, proceedings, etc.	918 43
Stationery	71,775 05
Postage (officers and departments)	4,321 33
Postage (schools)	1,565 02
Office equipment	2,583 11
Office supplies and incidentals	3,286 74
Printing for offices	2,938 49
Janitors' supplies	26,362 33
Expressage	1,950 03
Railroad and other fares for Horace Mann School pupils (except street car tickets)	1,760 82
Car tickets as authorized by Board	12,877 69
Carried forward	$595,916 48

Brought forward	$595,916 48
Tuition, wards of the city	12,236 85
Tuition, others (pupils attending school in Brookline) and in outside vocational schools, etc.	10,040 95
Diplomas	2,986 01
Removing ashes	2,262 90
Surety bonds	75 00
School Committee Contingent Fund	1,570 62
Board of Superintendents' Contingent Fund	910 61
Assistance at teachers' examinations	1,195 00
School exhibits	420 14
Telephone and telegraph	5,511 05
Telephone (schools)	1,041 78
Bath expenses	2,608 82
Badges for licensed minors	170 00
Improvement and Promotional Courses for Teachers	4,750 00
Supplies and equipment for automobiles	1,700 44
Services of accountants, auditing accounts	2,325 00
Expert services to Business Agent	1,547 00
Traveling expenses of Business Agent	231 68
Supplies for Department of Educational Investigation and Measurement	1,501 98
Automobile, Department of Physical Education	1,030 00
Automobile hire for emergency use	25 10
Sundries	1,547 71
Total	$651,605 12

FUEL AND LIGHT.

From the first of the financial year up to and including the fifteenth of May, it having been impossible to make contracts, coal was purchased wherever possible and at the best prices that could be obtained.

The coal was purchased from the following firms: Batchelder Brothers, Brighton Coal Company, D. Doherty Company, East Boston Coal Company, Massachusetts Wharf Coal Company, Metropolitan Coal Company, C. Murphy & Son, Roxbury Coal Company, Stetson Coal Company, John A. Whittemore's Sons.

From May 16 to the end of the financiai year, all coal was secured from the several coal companies under contract covering the period May 15 to end of the financial year.

In addition to the coal placed in the bins of the schoolhouses, bituminous coal was purchased and placed in storage during the financial year to the amount of

3,000 tons. This coal was placed in storage at the Milton yard of the City Fuel Company.

The prices paid for bituminous coal previous to May 15, 1921, range from $9.75 to $14.50 per ton of two thousand pounds. The prices paid for anthracite coal range from $14.75 to $17.50 per ton of two thousand pounds.

FUEL AND LIGHT.

Bituminous Coal. Number of Tons. Purchased.	Anthracite Coal. Number of Tons. Purchased.			
$24,697\frac{1141}{2000}$	$9,474\frac{865}{2000}$			$391,199 73
		Total		$391,199 73
		Expenses sampling, testing and expert advice on coal		1,296 70
		Expenses moving coal and wood		3,234 82
		$406\frac{1}{4}$ cords of wood		6,642 36
		Charcoal		—
				$402,373 61
		Add premiums allowed contractors on account of quality of coal exceeding contract requirements		—
				$402,373 61
		Deduct penalties exacted from contractors on account of quality of coal falling below contract requirements		—
				$402,373 61
		Deduct amount charged to appropriation, Extended Use of the Public Schools, for cost of fuel used in school centers and other activities		3,000 00
		Net total, fuel		$399,373 61
		LIGHT AND POWER.		
		Electric current for light	$72,373 12	
		Electric current for power	10,570 86	
		Gas	11,903 77	
		Mazda lamps	645 93	
			$95,493 68	
		Deduct amount charged to appropriation, Extended Use of the Public Schools, for cost of light used in school centers and other activities	2,000 00	
		Net total, light and power		93,493 68
		Total net expenditures, fuel and light		$492,867 29

COST IN DETAIL.

On the appended sheets will be found the costs of each school in detail, the average membership or the average attendance, and the cost per pupil based on average membership or average attendance, the cost per pupil hour of instruction, and the cost per pupil hour for all direct charges less credit for direct income.

The costs of the several playgrounds are also given and the cost per pupil per session.

The total cost of each group of schools is also given, and the average cost per pupil is shown.

These figures give only the costs of the several schools or groups of schools, exclusive of cost of administration, supervision and general charges.

To get the whole cost, the costs of administration, supervision and general charges must be apportioned among the several groups of schools.

The method of apportioning the costs of administration, supervision and general charges has been as follows: Any part of these costs which could be charged directly against a school or group of schools has been so charged. The remaining cost of administration, offices of superintendent, assistant superintendents, secretary, business agent and schoolhouse custodian have been apportioned to the several groups of schools in proportion to the number of teachers therein. For the purpose of this apportionment the number of teachers in the evening schools and summer review schools has been reduced to a basis which takes into consideration the amount of service rendered during the year as compared with that rendered by the teachers in the elementary day schools.

The method of apportioning the costs of the educational departments has been as follows: Any part of these costs which could be charged directly against a school or group of schools has been so charged; the balance of the costs of these departments has been apportioned in accordance with the method hereinafter described.

The costs of the departments of manual arts, music, practice and training and educational investigation and measurement have been apportioned to the several groups of schools in proportion to the number of teachers therein coming under the supervision of these several departments.

The cost of the department of evening schools has been divided as follows: Evening high schools, 25 per cent; evening elementary schools, 30 per cent; Boston Trade School, evening classes, 2 per cent; Evening school extension, 5 per cent; Day School for Immigrants, 30 per cent; afternoon Practical Arts classes, 5 per cent; Summer Practical Arts classes (canning), 3 per cent.

The whole of the costs of the offices of director of kindergartens, director of household science and arts and director of special classes has been charged to the elementary schools.

The cost of the office of director of penmanship has been apportioned to the several groups of schools in proportion to the number of teachers therein coming under the supervision of that office.

The cost of the office of commercial co-ordinator has been charged to the high schools.

The cost of vocational guidance has been apportioned to the high and elementary schools in proportion to the number of teachers therein.

The cost of attendance officers has been apportioned to the certificating office and the schools in proportion to the amount of service given to each.

The cost of the department of medical inspection, after any items which could be charged directly were so charged, has been apportioned as follows: The cost of the office of supervising nurse has been charged to elementary schools and the cost of the office of director of medical inspection has been apportioned to the several groups of schools in proportion to the number of teachers therein. The salary of the medical inspector has been charged to elementary schools.

The cost of the department of physical training after any items which could be charged directly were so charged has been apportioned as follows: The salary of the director of physical training has been apportioned to the several groups of schools and to the playgrounds in proportion to the estimated time required on each. The remaining costs of this department have been apportioned one-fourth to the playgrounds and the other three-fourths to the several groups of schools in proportion to the number of teachers therein.

The cost of supervision in connection with extended use of the public schools has been apportioned as follows: School centers, 85 per cent; use of school accommodations for municipal concerts, parents' meetings, etc., 15 per cent.

None of the cost of administration or the general account has been charged to playgrounds or the extended use of the public schools.

This apportionment is, of course, to a certain extent arbitrary, but as these costs of administration and supervision are given in detail any other apportionment can easily be made.

APPORTIONMENT OF INCOME.

Any part of the income which could be directly credited to a school or group of schools, office or department, has been so credited, and the balance has been apportioned in proportion to the number of teachers in each such school or group of schools:

The result is as follows:

Items of direct credit	$269,259 57	
Tuition receipts	85,082 50	
		$354,342 07

BALANCE APPORTIONED.

Normal School	122 15
Latin and high schools	4,495 23
Elementary schools	17,932 06
Speech Improvement classes	97 72
Horace Mann School	97 72
Carried forward	$377,086 95

Brought forward	$377,086 95
Trade School for Girls, day and extension classes	293 17
Boston Trade School	195 45
Continuation School, Compulsory	439 75
Boston Clerical School	73 29
Boston Disciplinary Day School	24 43
Day School for Immigrants	48 86
Summer Review High School	24 43
Summer Review elementary schools	122 15
Boston Trade School, evening classes	24 43
Evening high schools	146 59
Evening elementary schools	268 74
Evening school extension	24 43
Total income	$378,772 67

COST OF ADMINISTRATION, SUPERVISION AND GENERAL CHARGES.

ADMINISTRATION.

Secretary.

Salary of the Secretary		$5,496 00
Salary of Assistant Secretary, one-fifth time		600 00
Salaries of clerks and stenographers (four on full time, one to March 5, one on half time and one messenger from March 25)		7,780 66
Temporary clerical service		95 00
Books and subscriptions		—
Office supplies and equipment		583 71
Automatic time stamp		52 50
Typewriter (old typewriter taken in exchange)		17 50
Printing and binding		200 50
Telephone and telegraph	$46 73	
Telephone switchboard charge	99 39	
		146 12
Telegrams and messenger service		1 20
Postage		559 42
Boston Directory		8 00
Leather mailing bag		14 00
Car fares and incidentals		5 56
Total		$15,560 17

Business Agent.

Salary of the Business Agent	$5,748 00	
Salary of chief accountant	3,300 00	
Salaries of clerks and stenographers (thirteen on full time, one to December 25, one to January 3 and one from December 6)	23,836 51	
Temporary clerical service	1,936 76	
Pupil clerical assistance	112 34	
Salaries of supply room assistants (seven on full time, one to October 4 and one from October 20)	12,738 29	
Salaries of chauffeurs, automobile truck (two on full time)	3,023 66	
Temporary and emergency assistance, supply room	3,843 25	
Account books	333 97	
Surety bonds	70 00	
Carried forward	$54,942 78	

Brought forward		$54,942 78	
Books and subscriptions		5 00	
Office supplies and equipment		773 52	
Typewriters, 5 (three old typewriters in exchange)		360 33	
Monroe calculating machine		300 00	
Burroughs adding machine (old machine in exchange)		307 50	
Burroughs calculating machine		150 00	
Telephone and telegraph (office)	$198 79		
Telephone switchboard charge	351 77		
		550 56	
Printing		829 61	
Postage		453 70	
Binding account books and certifications		—	
Boston Directory		8 00	
Traveling expenses of Business Agent		231 68	
Car and railroad fares, assistants		16 60	
Lunches for assistants		16 01	
Allowance for petty cash transactions		250 00	
Telegrams and messenger service		12 71	
Incidentals		88 94	
		$59,296 94	
Credits:			
Allowance for petty cash transactions expended		250 00	
			$59,046 94
Supply Room.			
Equipment and supplies		$700 23	
Car fares		13 70	
Expressage		1,666 51	
Telephone and telegraph	$102 80		
Telephone switchboard charge	99 39		
		202 19	
Printing		9 90	
Postage		118 93	
Office supplies and equipment		78 45	
Office record books		79 30	
Binding record books		—	
Lunches for assistants		—	
Incidentals		10 71	
			2,879 92
Automobile Truck.			
Tires and tire repairs (including inner tubes)		$418 58	
Gasoline		263 27	
Lubricants		37 32	
Carried forward		$719 17	$61,926 86

Brought forward	$719 17	$61,926 86
Repairs and miscellaneous parts	134 39	
Registration fees	2 00	
Renewal of chauffeurs' licenses	6 00	
Incidentals	3 00	
		864 56
Total		$62,791 42

SCHOOLHOUSE CUSTODIAN.

Salary of Schoolhouse Custodian	$3,483 26	
Salary of stenographer	1,463 66	
Salary of janitor, assigned	3 34	
Temporary clerical service	66 00	
Pupil clerical assistance	20 70	
Office supplies and equipment	35 67	
Typewriter	89 10	
Printing	—	
Postage	141 06	
Telephone and telegraph $64 90		
Telephone switchboard charge 99 39		
	164 29	
Car tickets	45 00	
Incidentals	38 91	
		$5,550 99

Automobile.

Tires and tire repairs (including inner tubes)	$47 66	
Electric light	9 00	
Gasoline	134 28	
Registration fee	10 00	
Lubricants	6 45	
Miscellaneous parts and repairs	334 42	
Incidentals	4 02	
		545 83
Total		$6,096 82

SUPERINTENDENT.

Salary of Superintendent to October 23	$8,138 88
Salary of acting superintendent, from November 1 to November 7	194 43
Salary of Superintendent, from November 8	1,472 22
Salary of assistant secretary, four-fifths time	2,400 00
Salaries of clerks and stenographers (eleven full time, six on part time)	17,486 49
Temporary clerical service	818 34
Mimeograph	135 00
Carried forward	$30,645 36

Brought forward		$30,645 36	
Office supplies and equipment		613 97	
Printing		353 74	
Telephone and telegraph	$232 83		
Telephone switchboard charge	347 86		
		580 69	
Postage		378 00	
Boston Directory		8 00	
Traveling expenses		104 62	
Books and subscriptions		—	
Car fares and messenger service		2 11	
Incidentals		2 86	
			$32,689 35
Newsboys' Trial Board.			
Salaries of judges		$74 25	
Salary of clerk		46 50	
Printing		—	
			120 75
Total			$32,810 10
Credit:			
Typewriter transferred		$50 00	
Multigraph transferred		100 00	
			150 00
Net total			$32,660 10

ASSISTANT SUPERINTENDENTS.

Salaries of Assistant Superintendents (6) (four on full time, one to November 7 and one from November 8)		$29,883 33
Salary of Chief Examiner		3,948 40
Salaries of clerks and stenographers (three full time, three part time)		6,647 80
Temporary clerical service		144 00
Office supplies and equipment		430 14
Typewriter		89 10
Printing		403 79
Telephone and telegraph	$180 43	
Telephone switchboard charge	347 86	
		528 29
Postage		189 60
Traveling expenses of Chief Examiner, visiting candidates		16 36
Supplies for Chief Examiner		28 80
Postage for Chief Examiner		7 00
Assistance at teachers' examinations		1,195 00
Carried forward		$43,511 61

Brought forward	$43,511 61	
Supplies for examinations	57 76	
Traveling expenses, conventions	393 56	
Traveling expenses of Assistant Superintendents visiting candidates	50 68	
Car tickets	—	
Books and magazine subscriptions	174 47	
Membership in educational associations	15 00	
Incidentals	2 96	
Total		$44,206 04

ADMINISTRATION ACCOUNT.

Administration Building:		
Towels	$40 00	
Janitors' supplies	18 42	
Ice	18 47	
		$76 89
Mason Street Building:		
Salaries of janitors	$3,059 42	
Fuel	1,217 55	
Electric light	1,211 58	
Gas	171 63	
Janitors' supplies	87 72	
Towels	244 36	
Ice	161 04	
Supplies (stationery, etc.)	63 56	
Incidentals	48 89	
		6,265 75
Dartmouth Street:		
Salary of janitor	$659 36	
Fuel	300 00	
Electric light	110 30	
Towels	45 00	
Janitors' supplies	6 72	
Ice	48 00	
Incidentals	3 30	
		1,172 68
218 Tremont Street:		
Salary of janitor	$1,145 97	
Electric light	295 12	
Janitors' supplies	19 25	
Towels	51 60	
Ice	—	
Incidentals	1 75	
		1,513 69
801 City Hall Annex:		
Janitors' supplies	$1 00	
Towels	20 00	
		21 00
Carried forward		$9,050 01

Brought forward		$9,050 01
School Committee:		
Stationery and office supplies	$89 91	
Postage	38 26	
Printing	—	
Books	1 11	
Telephone and telegraph	—	
Refreshments	715 05	
Incidentals	—	
		844 33
General Expense:		
Auditing accounts of Business Agent	$2,075 00	
Professional services in connection with work and compensation of clerks and stenographers	375 00	
Advisory Committee on Music expenses	—	
Automobile hire	25 10	
Expenses, memorial services for Superintendent Frank V. Thompson	489 42	
Incidentals	16 15	
		2,980 67
Janitors' Trial Board:		
Attendance of janitor member at hearings	$12 00	
Salary, clerical assistant	—	
		12 00
Printing:		
Minutes	$1,516 83	
Index to minutes	1,099 54	
Binding minutes	128 20	
Binding documents	323 70	
Rules and regulations	2,916 75	
Teachers' examinations	1,724 30	
Manuals	2,939 74	
Pay rolls	373 55	
Bills and statements	—	
Requisition books	210 00	
Book labels	357 55	
Book receipts	—	
Normal School	—	
High and trade schools	64 85	
Normal, Latin and high schools, elementary and special schools	1,836 20	
Latin and high schools	1,752 45	
Elementary schools	653 85	
Summer Review high schools	16 95	
Summer Review elementary schools	63 45	
Summer Review schools	116 98	
Business Agent's report	1,803 00	
Superintendent's report	1,410 10	
Carried forward	$19,307 99	$12,887 01

Brought forward	$19,307 99	$12,887 01
Special syllabus for drawing and manual training and syllabus on shop work	1,049 80	
Course of study in mathematics, intermediate classes	58 90	
Course of study for Latin schools	228 30	
Course of study in French and Spanish	273 83	
Course of study in Italian	93 31	
Course of study in clerical practice	601 00	
Course of study for High School of Commerce	101 45	
Course of study for Normal school	78 10	
Course of study in physical education for Latin and high schools	273 50	
Rules and regulations for janitors and matrons	211 80	
Schedule of extra compensation for janitor service	196 95	
Circular on pensions to teachers	171 62	
Records for use in examinations	509 15	
Report on survey of intermediate schools	689 35	
List of books for home reading	333 50	
Lists, eligible candidates	350 60	
Circular of information relating to examination, certification and appointment of teachers and members of the supervising staff	459 46	
Reappointment of teachers and members of the supervising staff	258 75	
Schedule of teachers' salaries	71 25	
Annual statistics	1,300 00	
Stock for printing	2,287 99	
Miscellaneous	216 50	
		29,123 10
Total		$42,010 11

SUPERVISION OR PROFESSIONAL CONTROL.

Department of Practice and Training.

Salary of First Assistant Director	$2,901 29	
Salaries of Assistant Directors (two on full time, three on part time)	7,484 89	
Primary Supervisors (2)	5,060 48	
Master's assistant assigned from October 4	553 90	
Salary of clerk	1,619 66	
Office supplies and equipment	49 23	
Printing	173 50	
Postage	46 00	
Carried forward	$17,888 95	

Brought forward		$17,888 95	
Telephone	$99 39		
Telephone switchboard charge	120 72		
		220 11	
Books and subscriptions		56 00	
Car tickets		344 00	
Total			$18,509 06

DEPARTMENT OF EDUCATIONAL INVESTIGATION AND MEASUREMENT.

Salaries and Office Expenditures.

Salary of Assistant Director of Promotion and Educational Measurement	$3,258 00	
Salary of research assistant to October 5	924 35	
Temporary Examiner in Penmanship	580 00	
Salary of assistant, elementary schools, assigned (research assistant from October 6)	1,999 18	
Salaries of clerks (one on full time, one on part time and one from December 19)	1,582 95	
Temporary clerical services	75 00	
Office supplies and equipment	73 54	
Typewriter	50 00	
Postage	40 00	
Printing	—	
Telephone	—	
Car tickets	10 00	
Incidentals	1 14	
		$8,594 16

Educational Measurement.

Printing	$68 75	
Telephone	34 37	
Supplies for tests	1,355 90	
Repairs to clocks	—	
Incidentals	41 48	
		1,500 50
Total		$10,094 66

VOCATIONAL GUIDANCE.

Salary of Director	$2,894 00	
Salaries of vocational instructors (one on full time, one assigned as senior instructor from September 13, appointed vocational instructor December 20)	3,280 24	
Salaries of Vocational Assistants (three on full time, one from September 13 and one from September 26)	7,637 34	
Carried forward	$13,811 58	

Brought forward		$13,811 58	
Salaries of Temporary Vocational Assistants		2,954 00	
Salaries of clerks (one on full time, one from August 22)		2,102 99	
Temporary clerical service		—	
Pupil clerical assistance		100 80	
Traveling expenses		—	
Office supplies and equipment		224 60	
Printing		181 38	
Postage		127 00	
Telephone		206 86	
Car fares for vocational assistants		86 30	
Car fares for clerical assistants		12 50	
Books and subscriptions		69 64	
Boston business directory		5 00	
Incidentals		72	
Total			$19,883 37

SUPERVISION, DEPARTMENT OF MANUAL ARTS.

Salary of Director of Manual Arts		$3,918 06	
Salary of Associate Director		3,453 75	
Salaries of Assistant Directors (two on full time, one from September 13)		5,600 00	
Salaries of First Assistants in Manual Arts (two on full time)		4,739 55	
Salaries of Assistants in Manual Arts (eight on full time)		16,502 29	
Salary of prevocational assistant, assigned part time		1,901 76	
Instructor in Manual Arts, assigned		541 98	
Salaries of temporary teachers at Museum of Fine Arts		1,447 69	
Salary of Junior Master, assigned		3,280 92	
Salaries of teachers assigned to special classes		140 84	
Salaries of teachers, assigned, part time		180 04	
Salaries of teachers not otherwise charged		1,070 00	
Salaries of clerks (three on full time)		3,918 32	
Temporary clerical service		418 75	
Inventory account books		649 20	
Traveling expenses		99 86	
Mimeograph		135 00	
Office supplies and equipment		678 73	
Printing		559 04	
Postage		370 00	
Books and subscriptions		115 13	
Telephone switchboard charge	$49 69		
Telephone and telegraph	272 33		
		322 02	
Carried forward		$50,042 93	

Brought forward		$50,042 93	
Insurance on drawing materials		29 29	
Car tickets		655 00	
Incidentals		51 95	
			$50,779 17
Supplies for schools:			
Drawing supplies not otherwise charged	$406 66		
Manual training supplies not otherwise charged	88 11		
Printing lists of visits	130 35		
Plates, prints and photographs	67 96		
Incidentals	—		
			693 08
Gardening and canning:			
Salaries of Supervisors, Instructors and Assistants	$9,150 87		
Salaries of janitors	806 85		
Supplies, equipment and incidentals	2,117 70		
			12,075 42
Total			$63,547 67

SUPERVISION, DEPARTMENT OF MUSIC.

Salary of Director of Music		$3,978 00	
Salaries of Assistant Directors (four on full time)		11,370 78	
Temporary Assistant Directors		2,164 00	
Salaries of Assistants (nine on full time)		18,360 90	
Assistant, elementary schools, assigned		1,174 27	
Salaries of Violin Instructors		304 25	
Salary of clerks (two on part time)		526 34	
Office supplies and equipment		115 96	
Car tickets		340 00	
Printing		218 20	
Postage		66 50	
Telephone	$49 69		
Telephone switchboard charge	20 77		
		70 46	
Services in connection with outside study of music by pupils		198 00	
Printing, outside study of music		55 40	
Traveling expenses		—	
Books and subscriptions		7 48	
Incidentals		6 26	
			$38,956 80
Tuning and care of pianos			2,112 00
Total			$41,068 80

BOSTON PUBLIC SCHOOL SYMPHONY ORCHESTRA.

Instruments	$1,127 48	
Music stands	170 00	
Cymbal handles	1 00	
Covers for instruments	18 00	
Printing	—	
Total		$1,316 48

DIRECTOR OF KINDERGARTENS.

Salary of Director of Kindergartens	$3,250 35	
Salary of Assistant Director	2,208 70	
Salary of clerk (one on part time)	538 50	
Office supplies and equipment	51 75	
Car tickets	70 00	
Books and subscriptions	—	
Printing	33 06	
Postage	47 00	
Telephone $7 79		
Telephone switchboard charge 24 85		
	32 64	
Incidentals	—	
Total		$6,232 00

DIRECTOR OF HOUSEHOLD SCIENCE AND ARTS.

Salary of Director of Household Science and Arts	$3,357 05	
Salary of Assistant Director	1,970 31	
Prevocational Assistant, assigned	475 44	
Industrial Instructor, assigned	633 73	
Salary of teacher not otherwise charged	69 56	
Salary of clerk	1,463 66	
Books and subscriptions	—	
Office supplies and equipment	37 81	
Car tickets	145 00	
Printing	3 25	
Postage	54 00	
Telephone $7 79		
Telephone switchboard charge 24 85		
	32 64	
Incidentals	70	
Total		$8,243 15

DIRECTOR OF SPECIAL CLASSES.

Salary of Director of Special Classes	$2,898 00	
Salary of clerk (one on part time)	538 50	
Traveling expenses	—	
Books and subscriptions	5 80	
Carried forward	$3,442 30	

Brought forward		$3,442 30	
Office supplies and equipment		49 07	
Printing		—	
Postage		53 00	
Telephone	$9 08		
Telephone switchboard charge	49 69		
		58 77	
Supplies for classes not otherwise charged		—	
Car tickets		140 00	
Incidentals		76	
Total			$3,743 90

COMMERCIAL CO-ORDINATOR.

Salary of Junior Master assigned		$2,151 20	
Office supplies and equipment		14 53	
Printing		34 85	
Postage		7 00	
Books and subscriptions		—	
Telephone		15 14	
Car tickets		86 50	
Supplies for classes		87 58	
Total			$2,396 80

DIRECTOR OF PENMANSHIP.

Salary of Director		$2,658 00	
Assistant, elementary, assigned		718 64	
Salary of clerk (part time)		522 55	
Pupil clerical assistance		21 60	
Office supplies and equipment		132 79	
Books and subscriptions		14 72	
Sketches of certificates		30 00	
Plates for writing specimens		155 00	
Tax on penmanship pens		26 75	
Car tickets		116 20	
Printing		39 80	
Postage		85 50	
Telephone	$15 58		
Telephone switchboard charge	49 69		
		65 27	
Incidentals		18 21	
Total			$4,605 03

SUPERVISION, DEPARTMENT OF EVENING SCHOOLS.

Salary, Director of Evening Schools	$4,120 00	
Salary of Supervisor of Division "C" Classes	326 50	
Salaries of clerks (two on full time, one on part time)	3,096 24	
Carried forward	$7,542 74	

Brought forward		$7,542 74	
Temporary clerical services		—	
Office supplies and equipment		205 31	
Rental of typewriter		7 50	
Car tickets		72 10	
Printing		89 66	
Postage		148 50	
Boston Business Directory		3 00	
Telephone and telegraph	$149 08		
Telephone switchboard charge	138 69		
		287 77	
Incidentals		—	
			$8,356 58
For Evening Schools:			
Temporary clerical services		—	
Printing, evening high schools		$205 52	
Printing, evening elementary schools		38 65	
Printing, evening high and elementary schools		253 45	
Printing, evening elementary and trade schools		76 40	
Printing, evening trade schools		—	
Printing for all evening schools		—	
Diplomas		187 63	
Supplies		—	
			761 65
Total			$9,118 23

SUPERVISION, DEPARTMENT OF PHYSICAL TRAINING.

	Physical Education Appropriation.	Regular Appropriation.
Salary of Director of Physical Training	$3,978 00	
Salary of Supervisor, in charge of playgrounds, from June 7, 1921	943 02	
Salary of clerk	1,071 66	
Salary of clerks (two on part time)	560 66	
Salaries of Supervisors of Playgrounds, assigned (part time)	451 00	
Salaries of teachers, not otherwise charged	—	
Temporary clerical service	—	
Salary of janitor, play teachers' meetings	143 90	
Office supplies and equipment	105 87	$59 79
Printing	449 93	15 30
Postage	109 00	
Photos of playground activities	—	
Carried forward	$7,813 04	$75 09

SUPERVISION, DEPARTMENT OF PHYSICAL EDUCATION.—*Concluded.*

		Physical Education Appropriation.	Regular Appropriation.
Brought forward		$7,813 04	$75 09
Books and subscriptions		—	
Telephone and telegraph	$79 18		
Telephone switchboard charge	49 69		128 87
Incidentals		76 65	2 70
Car tickets		420 00	
Athletic certificates and military diplomas		966 46	
Playground certificates		—	
Badges, pins, etc., for physical tests		98 70	
Services, printing and supplies for athletic meets		270 94	
Services of judges, supplies, etc., for annual drills		800 50	
Printing for elementary schools		26 90	
Printing for Latin and high schools		150 15	
Printing, playgrounds		—	
Supplies used on Randidge trips		75 57	
Supplies sold out of stock		48 59	
Supplies not otherwise charged		3 20	
Use of tents, etc., annual parade		134 50	3 85
Incidentals, playgrounds		18 39	3 99
Automobile.			
Automobile	$1,030 00		
Tires and tire repairs (including inner tubes)	42 92		
Gasoline	55 90		
Registration	10 00		
Lubricants	1 30		
Miscellaneous parts and repairs, etc.	72 81		
Auto cover	4 50		
Auto robe	9 90		
Garage rental	25 00		
Incidentals	13		1,252 46
Sub-totals		$10,903 59	$1,466 96
Credit for playground equipment returned		181 00	
Totals		$10,722 59	$1,466 96
Total			$12,189 55
Deduct direct income			588 28
Net total			$11,601 27

SCHOOL PHYSICIANS AND NURSES.

Supervision, Department of Medical Inspection.

		School Physicians' and Nurses' Appropriation.	Regular Appropriation.
School Physicians.			
Salary of Director of Medical Inspection		$3,498 00	
Salary of Medical Inspector		2,328 00	
Salaries of physicians assigned to certificating office		1,332 63	
Salaries of physicians not otherwise charged		110 00	
Salary of clerk		1,463 66	
Temporary clerical service		120 80	
Office supplies and equipment		32 89	$39 84
Books and subscriptions		—	
Supplies for physicians and nurses		21 22	
Postage		58 50	
Stamped envelopes		367 30	
Telephone	$79 18		
Telephone switchboard charge	99 39		
		.....	178 57
Printing		683 95	
Car tickets		2 20	
Towels		9 00	
Incidentals		—	51
Nurses.			
Salary of Supervising Nurse		2,170 85	
Salary of Nurse, assigned to certificating office		132 00	
Salaries of nurses, assigned to playgrounds		460 00	
Salaries of nurses, not otherwise charged		689 36	
Office supplies and equipment		11 78	38 05
Books and subscriptions		3 00	
Supplies for physicians and nurses		16 56	
Printing		272 40	
Postage		62 00	
Car tickets		953 00	
Incidentals		—	
Sub-totals		$14,799 10	$256 97
Total		.....	$15,056 07

GENERAL CHARGES.

Attendance Officers.

Salary of Chief Attendance Officer		$3,468 26	
Salaries of Attendance Officers (twenty-five on full time, three from October 18)		54,595 00	
Salaries of temporary Attendance Officers		1,850 00	
Salaries of clerks (one from February and one on half time)		2,037 58	
Office supplies		134 95	
Temporary clerical service		66 00	
Rebuilding typewriter		30 00	
Printing		71 15	
Postage		285 00	
Telephone	$20 77		
Telephone switchboard charge	24 85		
		45 62	
Boston Business Directory		—	
Car tickets		1,426 50	
Incidentals		42	
			$64,010 48

Supervisor of Licensed Minors.

Salary of Supervisor of Licensed Minors		$2,418 00	
Salary of clerk		1,355 83	
Office supplies		13 98	
Telephone	$20 77		
Telephone switchboard charge	24 85		
		45 62	
Printing		75 55	
Postage		59 50	
Car tickets		90 00	
Badges and cards for licensed minors		170 00	
Incidentals		—	
			4,228 48
Total			$68,238 96

General Account.

Salary of City Treasurer, Custodian	$1,500 00	
Salaries of Teachers, not otherwise charged	771 75	
Salaries of Teachers, adjustments	148 34	
Salaries of Teachers, adjustments for military or naval service	1,336 07	
Sampling, testing and expert advice on coal	1,296 70	
Premium on fuel	—	
Storage of coal	932 83	
Cost of teaming and moving coal	2,979 12	
Advertising	515 05	
Diplomas	2,407 38	
Carried forward	$11,887 24	

Brought forward	$11,887 24	
Ribbon for diplomas	391 00	
Books purchased previous to 1921–22, paid for during 1921–22	469 66	
Supplies broken and lost in transit and at school	236 36	
Books and supplies sold out of stock	1,753 71	
Supplies used as samples	3 81	
Exhibits	231 09	
Penmanship material and diplomas	530 50	
Removing ashes	2,262 90	
Tuition, wards of the city	11,001 92	
Transportation, wards of the city	1,234 93	
Tuition, paid town of Brookline	8,056 50	
Tuition, paid town of Winthrop	245 51	
Transportation, paid town of Winthrop	33 85	
Tuition, paid Massachusetts Industrial Schools	35 50	
Tuition, paid Massachusetts Agricultural Schools	296 00	
Tuition, paid Normal School students at Boston College and Boston University	750 00	
Tuition, paid Middlesex County Training School	595 36	
Rebate on high school tuition	28 23	
Rebate on elementary school tuition	—	
Services of experts to the Business Agent on supplies, apparatus, etc.	1,547 00	
Short postage	11 39	
Conducting professional and cultural courses for teachers	5,157 46	
Supplies for courses	109 23	
Order of Court, payment to Mrs. Agnes C. White, Workmen's Compensation Act	520 00	
Difference in compensation paid to Janitors in United States service	1,532 79	
Miscellaneous telephone charges	—	
Barrels, cans, etc.	1,761 00	
Incidentals	10 01	
		$50,692 95
Credits:		
Discarded books	$1,753 96	
Barrels, cans, etc.	216 80	
Penalty exacted from contractors on account of quality of coal falling below standard requirements	563 15	
Supplies severally overcharged to schools and price adjustment	1,409 27	
Supplies put in stock and charged to special account 1921–22	2,260 27	
		6,203 45
Total		$44,489 50

EXTENDED USE OF THE PUBLIC SCHOOLS.

		Extended Use of the Public Schools Appropriation.	Regular Appropriation.
Salary of Director, Extended Use of the Public Schools		$3,344 52	
Salary of clerk		1,203 66	
Office supplies and equipment		3 27	$19 73
Printing and advertising		230 57	9 24
Postage		93 50	
Car tickets		45 00	
Telephone and telegraph	$45 43		
Telephone switchboard charge	49 69		95 12
Messenger services		—	
Advertising		—	
Services and expenses, activities		—	
Slides, etc		—	
Incidentals		13 85	
Sub-totals		$4,934 37	$124 09
Total			$5,058 46

SUMMARY.— COST OF ADMINISTRATION, SUPERVISION AND GENERAL CHARGES.

ADMINISTRATION.	Total.	Direct Income.	Net Total.
Secretary	$15,560 17	—	$15,560 17
Business Agent	62,791 42	—	62,791 42
Schoolhouse Custodian	6,096 82	—	6,096 82
Superintendent	32,660 10	—	32,660 10
Assistant Superintendents	44,206 04	—	44,206 04
Administration account, other items	42,010 11	—	42,010 11
	$203,324 66	—	$203,324 66
SUPERVISION OR PROFESSIONAL CONTROL.			
Department of Practice and Training	$18,509 06	—	$18,509 06
Department of Educational Investigation and Measurement	10,094 66	—	10,094 66
Vocational Guidance	19,883 37	—	19,883 37
Supervision, Department of Manual Arts	63,547 67	—	63,547 67
Supervision, Department of Music	41,068 80	—	41,068 80
Boston School Symphony Orchestra	1,316 48	—	1,316 48
Director of Kindergartens	6,232 00	—	6,232 00
Director of Household Science and Arts	8,243 15	—	8,243 15
Director of Special Classes	3,743 90	—	3,743 90
Commercial Co-ordinator	2,396 80	—	2,396 80
Director of Penmanship	4,605 03	—	4,605 03
Supervision. Department of Evening Schools	9,118 23	—	9,118 23
Supervision, Department of Physical Training	12,189 55	$588 28	11,601 27
Supervision, Department of Medical Inspection	15,056 07	—	15,056 07
Attendance Officers *	68,238 96	—	68,238 96
General Account	44,489 50	—	44,489 50
Supervision, Extended Use of the Public Schools	5,058 46	—	5,058 46
	$333,791 69	$588 28	$333,203 41
Total cost of administration, supervision and general charges	$537,116 35	$588 28	$536,528 07

* Including supervision of licensed minors.

APPORTIONMENT OF COSTS OF ADMINISTRATION, SUPERVISION AND GENERAL CHARGES.

Normal School	$2,706 48
Latin and high schools	93,903 03
Elementary schools	391,279 92
Horace Mann School	1,066 11
Trade School for Girls	4,057 30
Boston Trade School	2,800 96
Boston Clerical School	799 58
Boston Disciplinary Day School	1,856 77
Continuation School, Compulsory	8,715 76
Day School for Immigrants	3,010 31
Training school for teachers of Mechanic Arts	—
Summer Review High School	300 83
Summer Review elementary schools	1,459 48
Speech Improvement classes	1,066 12
Afternoon Practical Arts Classes	401 50
Carried forward	$513,424 15

Brought forward	$513,424 15
Recreational Handicraft Classes	—
Evening high schools	4,011 09
Evening elementary schools	8,996 10
Evening school extension	661 98
Boston Trade School, evening classes	528 80
Park playgrounds	1,923 75
Schoolyard playgrounds	1,923 74
School centers	4,299 69
School accommodations	758 77
Total	$536,528 07

TELEPHONE CHARGES.

All items of telephone costs which could be charged directly to the several offices have been so charged. In addition to such costs there is the cost of installation and operation of the switchboard. This is given in detail and includes the salaries of the operator and relief operator. The total cost of the switchboard is then apportioned to the several offices in proportion to the number of instruments connected to the switchboard.

Telephone Switchboard.

Salaries of operators	$1,429 66	
Switchboard rental	29 52	
Trunk lines	171 98	
Metallic circuits	262 04	
Telephone sets	162 03	
Operator's set	2 04	
Listings	4 02	
Service connection charges	33 50	
Toll calls and messages	33 74	
Incidentals	8 34	
		$2,136 87

Apportionment of Cost of Switchboard.

Secretary, $\frac{2}{43}$	$99 39
Business Agent, $\frac{4}{43}$	198 79
Supply room, $\frac{2}{43}$	99 39
Schoolhouse Custodian, $\frac{2}{43}$	99 39
Superintendent, $\frac{7}{43}$	347 86
Assistant Superintendents, $\frac{7}{43}$	347 86
Department of Practice and Training, $\frac{2}{43}$	99 39
Supervision, Department of Manual Arts, $\frac{1}{43}$	49 69
Carried forward	$1,341 76

Brought forward	$1,341 76	
Supervision, Department of Music, $\frac{1}{43}$ . .	49 69	
Supervision, Department of Evening Schools, $\frac{3}{43}$	149 08	
Director of Household Science and Arts, $\frac{1}{86}$.	24 85	
Director of Kindergartens, $\frac{1}{86}$	24 85	
Director of Special Classes, $\frac{1}{43}$	49 69	
Director of Penmanship, $\frac{1}{43}$	49 69	
Supervision, Department of Physical Training, $\frac{1}{43}$	49 69	
Supervision, Department of Medical Inspection, $\frac{2}{43}$	99 39	
Attendance Officers, $\frac{1}{86}$	24 85	
Supervisor of Licensed Minors, $\frac{1}{86}$ . . .	24 85	
Director, Extended Use of the Public Schools, $\frac{1}{43}$	49 69	
Continuation School, Compulsory, $\frac{4}{43}$ . .	198 79	
		$2,136 87

STOCK BALANCE, 1921-1922.

1921–22 Stock Balance.

Debit.

Inventory of December 1, 1920:		
Books	$6,490 52	
Manual training supplies	2,613 52	
Drawing supplies	4,817 57	
Kindergarten supplies	2,173 02	
Janitors' supplies	5,291 57	
Miscellaneous educational supplies	33,192 20	
Laboratory supplies	12 27	
Nurses' supplies	1,599 32	
Physical education supplies	3,846 69	
Medical inspection supplies	605 90	
Supplies for extended use of public schools	103 65	
Fuel	38,595 40	
		$99,341 63
Receipts, 1921–22:		
Purchases:		
Books	$6,348 83	
Manual training supplies	12,737 32	
Drawing supplies	8,573 72	
Kindergarten supplies	10,901 75	
Janitors' supplies	19,557 59	
Miscellaneous educational supplies	96,011 54	
Laboratory supplies	17 00	
Sewing supplies	3,419 00	
Busy work supplies	15,137 92	
Cookery supplies	413 87	
Physical education supplies	6,185 82	
Supplies for school physicians and nurses	2,005 65	
Supplies for extended use of the public schools	260 00	
Fuel	20,250 00	
		201,820 01
From schools:		
Books	$235 71	
Manual training supplies	302 13	
Drawing supplies	.7 85	
Kindergarten supplies	20 25	
Janitors' supplies	25 16	
Miscellaneous educational supplies	421 43	
Busy work supplies	12 48	
Cookery supplies	1 34	
Physical education supplies	258 00	
		1,284 35
Kindergarten supplies overcharged to schools	$1,182 90	
Manual training supplies overcharged to schools	1,022 05	
Physical education supplies overcharged to schools	506 30	
Janitors' supplies overcharged to schools	945 89	
Cookery supplies overcharged to schools	133 80	
Laboratory supplies overcharged to schools	05	
Supplies for school physicians and nurses overcharged to schools	54 18	
Supplies for extended use of the public schools overcharged to schools	37 75	
Supplies received before inventory taking and charged to special fund 1921–22	2,260 27	
		6,143 19
Discarded books		1,753 96
Total		$310,343 14

Note.— The items included in the above account are only those purchased for general distribution and do not include those purchased for any particular school. The latter are charged direct to the school.

1921–22 Stock Balance.

Credit.

Deliveries on requisitions:		
Books	$7,997 64	
Manual training supplies	10,028 90	
Drawing supplies	8,371 27	
Kindergarten supplies	8,348 92	
Janitors' supplies	19,573 26	
Miscellaneous educational supplies	103,061 07	
Sewing supplies	2,520 99	
Busy work supplies	13,523 76	
Cookery supplies	539 49	
Laboratory supplies	4 56	
Physical education supplies	7,172 53	
Supplies for school physicians and nurses	2,054 52	
Supplies for extended use of public schools	138 50	
Fuel	38,928 95	
		$222,264 36
Drawing supplies not severally charged to schools	$1,328 80	
Busy work supplies not severally charged to schools	1,134 27	
Sewing supplies not severally charged to schools	10 58	
		2,473 65
Discarded books		1,753 96
Inventory, December 1, 1921:		
Books	$5,077 42	
Manual training supplies	7,004 35	
Drawing supplies	3,699 07	
Kindergarten supplies	5,929 00	
Janitors' supplies	6,246 95	
Miscellaneous educational supplies	25,497 69	
Sewing supplies	1,675 82	
Busy work supplies	2,511 32	
Cookery supplies	170 63	
Laboratory supplies	24 76	
Supplies for school physicians and nurses	2,210 53	
Physical education supplies	3,624 28	
Supplies for extended use of public schools	262 90	
Fuel	19,916 45	
		83,851 17
Total		$310,343 14

Note.— The items included in the above account are only those purchased for general distribution and do not include those purchased for any particular school. The latter are charged direct to the school.

Summary of Costs of Schools and Other Activities.

	Costs Exclusive of Administration, Supervision and General Charges and With Direct Income Deducted	Costs with Costs of Administration, Supervision and General Charges Added.	Costs with Apportioned Income Deducted.
Normal	$62,500 63	$65,207 11	$62,998 96
Latin and high schools	2,006,165 87	2,100,068 90	2,084,449 98
Elementary schools	6,644,528 75	7,035,808 67	7,015,061 27
Speech Improvement classes	24,629 20	25,695 32	25,570 80
Boston Clerical School	26,188 72	26,988 30	26,434 01
Boston Disciplinary Day School	7,976 43	9,833 20	9,808 77
Horace Mann School	45,549 72	46,615 83	1,622 04
Trade School for Girls	44,707 56	48,764 86	42,412 59
Boston Trade School, day classes	67,190 51	69,991 47	53,753 75
Boston Trade School, Summer Rehabilitation Classes for Federal Students	5,395 18	5,395 18	5,395 18
Continuation School, Compulsory	67,243 03	75,958 79	75,429 04
Day School for Immigrants	7,431 90	10,442 21	10,382 15
Training School for Teachers of Mechanic Arts	1,429 16	1,429 16	523 20
Summer Review High School	5,647 28	5,948 11	5,923 68
Summer Review elementary schools	20,781 55	22,241 03	22,108 88
Evening high schools	58,860 07	62,871 16	59,803 14
Evening elementary schools	68,916 75	77,912 85	57,396 00
Evening school extension	4,538 68	5,200 66	5,176 23
Boston Trade School, Evening Classes	8,416 19	8,944 99	8,440 49
Afternoon Practical Arts classes	1,021 35	1,422 85	1,422 85
Recreational Handicraft classes	889 95	889 95	889 95
Park Playgrounds	41,587 46	43,511 21	43,511 21
Schoolyard Playgrounds	18,478 93	20,402 67	20,402 67
Extended use of the public schools: School centers	42,106 88	46,406 57	46,406 57
Use of school accommodations	5,212 85	5,971 62	5,971 62
Totals	$9,287,394 60	$9,823,922 67	$9,691,295 03
Add cost of administration, supervision and general charges	536,528 07		
Total	$9,823,922 67		
Deduct apportioned income (including tuition)	132,627 64		
Net total	$9,691,295 03		
Net total brought down	$9,691,295 03		
Add total income (direct and apportioned)	378,772 67		
Total	$10,070,067 70		
Decrease in inventory	15,490 46		
Total expenditures, 1921–22 *	$10,054,577 24		

* Exclusive of pensions, cost of buildings, depreciation, interest and sinking fund charges.

TABLE SHOWING COST OF ADMINISTRATION FOR THE YEARS 1911–12 AND 1921–22, AND THE INCREASES IN TEN YEARS.

	1911–12.	1921–22.	Increases in Ten Years.	Increases in Ten Years, Per Cent.
Secretary	$10,326 66	$15,560 17	$5,233 51	50.6
Business Agent*	†36,127 57	62,791 42	26,663 85	73.8
Schoolhouse Custodian	4,356 93	6,096 82	1,739 89	39.9
Superintendent	16,880 65	32,660 10	15,777 45	93.4
Assistant Superintendents	30,900 31	44,206 04	13,305 73	43.0
Administration Account, Other Items	16,725 58	42,010 11	25,284 53	151.1
Totals	$115,317 70	$203,324 66	$88,006 96	76.3

* Duties of Auditor transferred to Business Agent, October 14, 1912. † Including Auditor.

TABLE SHOWING COSTS OF SUPERVISION OR PROFESSIONAL CONTROL FOR THE YEARS 1911–12 AND 1921–22, AND THE INCREASES IN TEN YEARS.

	1911–12.	1921–22.	Increases in Ten Years.	Increases in Ten Years, Per Cent.
Department of Practice and Training	* $5,556 96	$18,509 06	$12,952 10	233.0
Department of Educational Investigation and Measurement	—	10,094 66	10,094 66	—
Vocational Guidance	1,986 05	19,883 37	17,897 32	901.1
Department of Manual Arts	15,422 03	63,547 67	48,125 64	312.0
Department of Music	19,802 72	41,068 80	21,266 08	107.3
Director of Kindergartens	1,934 78	6,232 00	4,297 22	222.1
Director of Household Science and Arts	2,269 72	8,243 15	5,973 43	263.1
Director of Special Classes	—	3,743 90	3,743 90	—
Commercial Co-ordinator	—	2,396 80	2,396 80	—
Director of Penmanship	—	4,605 03	4,605 03	—
Department of Evening Schools	4,971 19	9,118 23	4,147 04	83.4
Department of Physical Training Department of Medical Inspection	† 10,159 04	11,601 27 15,056 07	16,498 30	162.4
Totals	$62,102 49	$214,100 01	$151,997 52	244.7

* Supervisor of Substitutes.

† Excluding salaries of Assistant Instructors of Physical Training and Instructor and Assistant Instructors in Military Drill and Armorer.

STATISTICS 1911–12 AND 1921–22.

	1911–12.	1921–22.	Increases in Ten Years.	Increases in Ten Years, Per Cent.
Total expenditures*	*$4,277,938 30	*$10,154,898 55	$5,876,960 25	137.3
Day Schools:				
Average membership	99,272	† 115,904	16,632	16.7
Average attendance	91,049	† 107,605	16,556	18.1
Summer Schools:				
Average attendance	209	4,409	2,200	1,052.6
Evening Schools:				
Average attendance	7,964	6,125	‡ 1,839	‡ 23.0
Evening School Extension:				
Average attendance	716	892	176	24.5
Playgrounds:				
Average attendance	7,391	14,143	6,752	91.3

* Exclusive of new buildings, repairs and alterations and extended use of the public schools.

† Exclusive of Continuation School, Speech Improvement Classes, Day School for Immigrants and Afternoon Practical Arts Classes.

‡ Decrease.

TABLE SHOWING COSTS OF ADMINISTRATION FOR THE YEARS 1908–09 AND 1921–22, AND THE INCREASES IN THIRTEEN YEARS.

	1908–09.	1921–22.	Increases in Thirteen Years.	Increases in Thirteen Years, Per Cent.
Secretary	$8,124 73	$15,560 17	$7,435 44	91.5
Business Agent *	† 24,112 92	62,791 42	38,678 50	160.4
Schoolhouse Custodian	3,011 74	6,096 82	3,085 08	102.4
Superintendent	13,240 53	32,660 10	19,419 57	146.6
Assistant Superintendents	28,812 84	44,206 04	15,393 20	53.4
Administration Account, other items	13,454 54	42,010 11	28,555 57	212.2
Totals	$90,757 30	$203,324 66	$112,567 36	124.0

* Duties of Auditor transferred to Business Agent October 14, 1912. † Including Auditor.

TABLE SHOWING COSTS OF SUPERVISION OR PROFESSIONAL CONTROL FOR THE YEARS 1908–09 AND 1921–22, AND THE INCREASES IN THIRTEEN YEARS.

	1908–09.	1921–22.	Increases in Thirteen Years.	Increases in Thirteen Years, Per Cent.
Department of Practice and Training	* $3,192 79	$18,509 06	$15,316 27	479.7
Department of Educational Investigation and Measurement	—	10,094 66	10,094 66	—
Vocational Guidance	—	19,883 37	19,883 37	—
Department of Manual Arts	13,510 37	63,547 67	50,037 30	370.3
Department of Music	19,331 20	41,068 80	21,737 60	112.4
Director of Kindergartens	1,807 81	6,232 00	4,424 19	244.7
Director of Household Science and Arts	1,486 51	8,243 15	6,756 64	454.5
Director of Special Classes	—	3,743 90	3,743 90	—
Commercial Co-ordinator	—	2,396 80	2,396 80	—
Director of Penmanship	—	4,605 03	4,605 03	—
Department of Evening Schools	3,050 46	9,118 23	6,067 77	198.9
Department of Physical Training	16,878 34	11,601 27	9,779 00	57.9
Department of Medical Inspection		15,056 07		
Totals	$59,257 48	$214,100 01	$154,842 53	261.3

* Supervisor of Substitutes.

STATISTICS 1908–09 AND 1921–22.

	1908–09.	1921–22.	Increases in Thirteen Years.	Increases in Thirteen Years, Per Cent.
Total expenditures *	*$3,621,304 48	*$10,154,898 55	$6,533,594 07	180.4
Day Schools:				
Average membership	96,925	† 115,904	18,979	19.5
Average attendance	88,475	† 107,605	19,130	21.6
Summer Schools:				
Average attendance	—	4,409	4,409	—
Evening Schools:				
Average attendance	7,778	6,125	‡ 1,653	‡ 21.2
Evening School Extension:				
Average attendance	—	892	892	—
Playgrounds:				
Average attendance	12,264	14,143	1,879	15.3

* Exclusive of new buildings, repairs and alterations and extended use of the public schools.
† Exclusive of Continuation School, Speech Improvement Classes, Day School for Immigrants and Afternoon Practical Arts Classes.
‡ Decrease.

Per Capita Costs of Teachers' Salaries, Books, Other Educational Supplies, All Educational Supplies and Incidentals and Total for Instruction, Based on Average Attendance.

Normal School.

	Teachers' Salaries.*	Books.	Other Educational Supplies and Incidentals.*	All Educational Supplies and Incidentals.*	Total for Instruction.*
Norma	$182 86	$2 82	$23 16	$25 98	$208 84

Latin and High Schools.

	Teachers' Salaries.*	Books.	Other Educational Supplies and Incidentals.*	All Educational Supplies and Incidentals*	Total for Instruction.*
Public Latin	$99 04	$4 83	$7 59	$12 42	$111 46
Girls' Latin	85 60	3 98	7 11	11 09	96 69
Brighton High	83 97	3 54	11 29	14 83	98 80
Charlestown High	107 89	4 25	17 94	22 19	130 08
Dorchester High	93 83	3 43	12 91	16 34	110 17
East Boston High	82 96	2 72	12 46	15 18	98 14
English High	100 17	3 13	7 18	10 31	110 48
Girls' High	80 85	2 64	8 07	10 71	91 56
High School of Commerce	104 82	2 15	8 33	10 48	115 30
High School of Practical Arts	137 72	2 00	15 44	17 44	155 16
Hyde Park High	95 80	3 05	13 69	16 74	112 54
Mechanic Arts High	143 68	2 57	14 50	17 07	160 75
Roxbury High	72 62	3 00	10 12	13 12	85 74
South Boston High	95 16	2 50	7 45	9 95	105 11
West Roxbury High	87 39	3 05	12 02	15 07	102 46
Averages	$97 17	$3 07	$10 35	$13 42	$110 59

* Exclusive of physical education.

Elementary Schools.

	Teachers' Salaries.*	Books.	Other Educational Supplies and Incidentals.*	All Educational Supplies and Incidentals.*	Total for Instruction.*
Abraham Lincoln	$55 26	$1 43	$1 92	$3 35	$58 61
Agassiz	78 20	1 56	2 85	4 41	82 61
Bennett	59 22	1 06	1 62	2 68	61 90
Bigelow	66 38	1 14	2 06	3 20	69 58
Blackinton-John Cheverus	60 45	1 03	2 26	3 29	63 74
Bowditch	59 58	88	1 82	2 70	62 28
Bowdoin	71 27	94	2 35	3 29	74 56
Chapman	58 62	1 49	2 07	3 56	62 18
Charles Sumner	62 97	1 62	2 67	4 29	67 26
Christopher Gibson	61 39	1 29	2 37	3 66	65 05
Dearborn	59 89	1 24	2 46	3 70	63 59
Dillaway	61 35	1 27	1 66	2 93	64 28
Dudley	67 23	1 00	2 72	3 72	70 95
Dwight	70 15	1 76	3 86	5 62	75 77
Edmund P. Tileston	67 44	1 36	2 42	3 78	71 22
Edward Everett	59 83	1 30	1 83	3 13	62 96
Elihu Greenwood	57 39	2 17	2 73	4 90	62 29
Eliot	50 72	90	2 23	3 13	53 85
Emerson	58 20	1 20	2 15	3 35	61 55
Everett	59 25	1 30	2 35	3 65	62 90
Francis Parkman	56 29	1 02	2 54	3 56	59 85
Franklin	63 86	1 47	1 79	3 26	67 12
Frederic W. Lincoln	62 89	1 41	2 61	4 02	66 91
Gaston	60 31	1 44	1 47	2 91	63 22
George Putnam Intermediate	63 06	1 48	3 07	4 55	67 61
Gilbert Stuart	66 82	2 09	1 96	4 05	70 87
Hancock	58 25	1 12	1 70	2 82	61 07
Harvard-Frothingham	68 68	93	2 48	3 41	72 09
Henry Grew	56 44	1 29	1 75	3 04	59 48
Henry L. Pierce	60 22	1 41	2 38	3 79	64 01
Hugh O'Brien	55 70	1 29	2 32	3 61	59 31
Hyde	70 85	95	1 95	2 90	73 75

* Exclusive of physical education.

Elementary Schools.— Continued.

	Teachers' Salaries.*	Books.	Other Educational Supplies and Incidentals.*	All Educational Supplies and Incidentals.*	Total for Instruction.*
Jefferson	$61 71	$0 84	$2 10	$2 94	$64 65
John A. Andrew	51 65	59	1 61	2 20	53 85
John Marshall	58 42	1 53	1 46	2 99	61 41
John Winthrop	58 64	1 42	1 93	3 35	61 99
Julia Ward Howe	55 43	1 21	1 66	2 87	58 30
Lawrence	64 19	1 36	2 45	3 81	68 00
Lewis Intermediate	60 88	1 93	2 11	4 04	64 92
Longfellow	57 71	1 53	1 71	3 24	60 95
Lowell	61 30	1 13	1 96	3 09	64 39
Martin	83 20	1 53	2 63	4 16	89 36
Mary Hemenway	56 97	1 00	1 76	2 76	59 73
Mather	55 76	1 24	1 85	3 09	58 85
Minot	60 66	1 16	2 30	3 46	64 12
Norcross	65 00	1 23	1 63	2 86	67 86
Oliver Hazard Perry	67 84	1 41	2 27	3 68	71 52
Oliver Wendell Holmes Intermediate	74 26	3 10	4 43	7 53	81 79
Phillips Brooks	57 42	1 39	1 66	3 05	60 47
Prescott	37 62	1 20	3 58	4 78	42 40
Prince	62 08	1 49	2 22	3 71	65 79
Quincy	72 55	1 13	2 49	3 62	76 17
Rice	56 57	1 47	1 99	3 46	60 03
Robert G. Shaw	60 95	1 41	2 12	3 53	64 48
Roger Wolcott	55 53	1 26	2 16	3 42	58 95
Samuel Adams	50 17	1 62	1 89	3 51	53 68
Sherwin	88 94	1 23	3 11	4 34	93 28
Shurtleff	54 60	1 63	1 39	3 02	57 62
Theodore Lyman	57 26	1 53	2 07	3 60	60 86
Thomas Gardner	55 02	1 20	1 68	2 88	57 90
Thomas N. Hart	63 47	1 19	2 01	3 20	66 67
Ulysses S. Grant	63 44	1 31	2 33	3 64	67 08
Warren-Bunker Hill	64 16	1 23	1 97	3 20	67 36
Washington	57 26	1 14	1 78	2 92	60 18

* Exclusive of physical education.

Elementary Schools.— Concluded.

	Teachers' Salaries.*	Books.	Other Educational Supplies and Incidentals.*	All Educational Supplies and Incidentals.*	Total for Instruction.*
Washington Allston	$63 05	$0 77	$3 11	$3 88	$66 93
Wells	60 43	94	1 15	2 09	62 52
Wendell Phillips	65 07	1 30	2 29	3 59	68 66
William E. Endicott	52 22	1 10	1 42	2 52	54 74
William E. Russell	63 40	1 36	1 95	3 31	66 71
William Lloyd Garrison	54 98	1 55	1 91	3 46	58 44
Averages	$60 31	$1 30	$2 11	$3 41	$63 72

* Exclusive of physical education.

Special Schools.

	Teachers' Salaries.*	Books.	Other Educational Supplies and Incidentals.*	All Educational Supplies and Incidentals.*	Total for Instruction.*
Horace Mann	$287 32	$1 11	$4 35	$5 46	$292 78
Boston Clerical	119 40	3 46	22 07	25 53	144 93
Boston Disciplinary Day	188 25	3 10	2 87	5 97	194 22
Boston Trade, Day Classes	179 90	5 12	37 64	42 76	221 66

* Exclusive of physical education.

Per Capita Costs of Janitors' Supplies Based on Average Attendance.

Normal School.

School.	Janitors' Supplies.
Normal	$0 52

Latin and High Schools.

Schools.	Janitors' Supplies.	Schools.	Janitors' Supplies.
Public Latin	$0 17	High School of Commerce	$0 21
Girls' Latin	17	High School of Practical Arts	47
Brighton High	19	Hyde Park High	31
Charlestown High	31	Mechanic Arts High	32
Dorchester High	18	Roxbury High	19
East Boston High	33	South Boston High	29
English High	13	West Roxbury High	23
Girls' High	26	Average	23

Elementary Schools.

Schools.	Janitors' Supplies.	Schools.	Janitors' Supplies.
Abraham Lincoln	$0 08	Dudley	$0 36
Agassiz	11	Dwight	34
Bennett	29	Edmund P. Tileston	10
Bigelow	28	Edward Everett	29
Blackinton-John Cheverus	26	Elihu Greenwood	15
Bowditch	26	Eliot	14
Bowdoin	29	Emerson	15
Chapman	39	Everett	31
Charles Sumner	31	Francis Parkman	21
Christopher Gibson	17	Franklin	27
Dearborn	22	Frederic W. Lincoln	36
Dillaway	37	Gaston	19

PER CAPITA COSTS OF JANITORS' SUPPLIES BASED ON AVERGAE ATTENDANCE.— *Concluded.*

Elementary Schools.— Concluded.

SCHOOLS.	Janitors' Supplies.	SCHOOLS.	Janitors' Supplies.
George Putnam Intermediate	$0 29	Phillips Brooks	$0 17
Gilbert Stuart	20	Prescott	26
Hancock	20	Prince	19
Harvard-Frothingham	21	Quincy	26
Henry Grew	14	Rice	11
Henry L. Pierce	28	Robert G. Shaw	21
Hugh O'Brien	19	Roger Wolcott	25
Hyde	20	Samuel Adams	27
Jefferson	14	Sherwin	32
John A. Andrew	27	Shurtleff	12
John Marshall	24	Theodore Lyman	18
John Winthrop	18	Thomas Gardner	26
Julia Ward Howe	17	Thomas N. Hart	18
Lawrence	25	Ulysses S. Grant	15
Lewis Intermediate	36	Warren-Bunker Hill	33
Longfellow	20	Washington	12
Lowell	23	Washington Allston	19
Martin	41	Wells	19
Mary Hemenway	14	Wendell Phillips	20
Mather	18	William E. Endicott	14
Minot	17	William E. Russell	28
Norcross	28	William Lloyd Garrison	16
Oliver Hazard Perry	18	Average	$0 22
Oliver Wendell Holmes Intermediate	25		

Special Schools.

SCHOOLS.	Janitors' Supplies.
Horace Mann	$0 73
Boston Clerical	15
Boston Disciplinary Day	55
Boston Trade, Day Classes	89

STANDARD REPORT ON THE FINANCIAL STATISTICS OF THE PUBLIC SCHOOLS.

STANDARD REPORT ON THE FINANCIAL STATISTICS OF THE PUBLIC SCHOOLS.*

A. PAYMENTS.

1.— EXPENSES (Cost of Conducting School System).	Total.	Salaries.	Other Objects.
EXPENSES OF GENERAL CONTROL (OVERHEAD CHARGES).			
1. Board of Education and Secretary's Office	$16,416 50	$13,983 66	$2,432 84
2. School elections and school census	—	—	—
3. Finance offices and accounts †	62,791 42	54,538 81	8,252 61
4. Legal services ‡	—	—	—
5. Operation and maintenance of office buildings	20,731 32	4,864 75	15,866 57
6. Officers in charge of buildings	99,502 39	87,146 22	12,356 17
6a. Schoolhouse Custodian	6,096 82	4,967 62	1,129 20
7. Office of Superintendent of Schools	105,469 86	97,294 34	8,175 52
8. Enforcement of compulsory education and truancy laws	68,238 96	65,790 67	2,448 29
9. Other expenses of general control	54,278 30	5,288 95	48,989 35
10. Totals	$433,525 57	$333,875 02	$99,650 55

* This standard form corresponds to Schedule G 34 of the Bureau of the Census and has been worked out by that bureau after conference and correspondence with representatives of the United States Bureau of Education, the National Education Association, the National Association of Public School Business Officials and with many school superintendents.

† Also in charge of supplies.

‡ Undertaken by Law Department of the city without expense to the School Committee.

A. PAYMENTS.—*Continued.*

EXPENSES OF INSTRUCTION.	Total.	Day Schools.		Evening Schools.					Special Schools and Activities.														Extended Use of the Public Schools	
		Elementary, Including Kindergarten.	Latin and High.	Evening Elementary.	Evening High.	Evening School Extension.	Afternoon Practical Arts Classes.	Boston Trade School Evening Classes.	Normal School.	Horace Mann School for the Deaf.	Schools for the Industries.	Continuation School.	Day School for Immigrants.	Boston Clerical School.	Boston Disciplinary Day School.	Training School for Teachers of Mechanic Arts.	Speech Improvement Classes.	Recreational Handicraft Classes.	Summer Review High School.	Summer Review Elementary Schools.	Playgrounds.	Summer Rehabilitation Classes.	School Centers.	Use of School Accommodations for Various Purposes.
11. Salaries of supervisors of grades and subjects	$137,665 16	$99,060 99	$22,613 92	$2,606 67	$1,899 74	$364 73	$360 81	$148 24	$513 88	$32 51	$170 99	$70 58	$2,244 88	$24 38	$8 13	—	$32 51	—	$3 92	$19 60	$2,940 50	—	‡ $3,865 95	‡ $682 23
12. Other expenses of supervisors	17,950 15	10,559 02	4,683 25	653 41	576 05	41 37	40 69	24 68	60 24	10 06	53 92	12 32	253 66	7 54	2 51	—	10 06	—	68	3 42	446 99	—	433 74	76 54
13. Salaries of principals	377,251 99	274,793 47	67,705 52	5,885 50	4,383 00	606 00	—	409 00	4,698 00	3,532 00	8,287 00	3,312 00	—	1,174 50	—	—	—	—	312 00	2,154 00	—	—	—	—
13a. Salaries of clerks to principals	50,885 86	6,788 56	26,292 24	1,802 00	2,123 00	—	—	543 06	1,256 10	---	5,880 32	5,663 38	—	278 40	—	—	19 80	—	—	—	—	$200 00	—	—
14. Other expenses of principals	9,149 17	2,689 26	1,695 15	86 57	141 74	—	—	25 75	118 85	29 78	2,363 36	1,561 68	205 28	46 70	1 60	—	165 15	—	2 00	29 32	—	—	Cr. 13 02	—
15. Salaries of teachers	7,324,916 58	5,125,565 01	1,604,427 17	41,659 50	37,623 75	2,633 50	1,452 00	9,690 75	45,556 22	35,604 60	137,471 58	123,449 18	13,697 20	18,965 23	6,400 55	$1,345 41	20,720 83	$666 99	4,790 50	15,914 00	45,839 85	4,163 00	‡ 26,230 25	‡ 1,050 50
16. Text-books, supplementary and reference books	173,040 35	115,182 64	51,391 19	565 95	1,162 38	—	—	—	762 56	151 61	2,037 69	65 13	392 11	590 99	105 31	23 62	367 04	—	78 45	—	—	163 68	—	—
17. Stationery and supplies used in instruction	353,037 18	184,255 05	108,766 43	1,459 78	2,268 22	Cr. 3 14	—	1,716 61	3,251 75	546 39	22,537 55	8,776 09	483 80	3,716 18	48 90	60 13	216 01	221 91	191 85	584 26	8,954 00	548 07	4,407 34	—
18. Other expenses of instruction	4,184 14	783 99	629 76	67 25	40 00	—	—	1 80	5 38	3 30	—	98 39	—	99	44 10	—	—	2 04	—	3 56	—	33	2,485 75	17 50
19. TOTAL FOR INSTRUCTION	$8,448,080 58	$5,819,677 99	$1,888,204 63	$54,786 63	$50,217 88	$3,642 46	$1,853 50	$12,559 89	$56,222 98	$39,910 25	$178,811 41	$143,038 75	$17,276 93	$24,804 91	$6,611 10	$1,429 16	$21,561 40	$889 95	$5,379 40	$18,708 16	$58,181 34	$5,075 08	$37,410 01	$1,826 77
EXPENSES OF OPERATION OF SCHOOL PLANT.																								
20. Wages of janitors and other employees	$573,459 54	$419,097 80	$88,633 16	$9,803 58	$5,760 35	$943 68	—	$1,483 62	$4,143 75	$2,434 30	$10,379 70	$4,580 68	$741 50	$760 91	$346 07	—	$1,716 73	---	$229 34	$1,745 72	$5,272 54	$312 40	$8,819 32	$6,254 39
21. Fuel	419,528 01	331,214 89	57,903 48	4,899 75	3,468 62	192 15	—	1,171 65	2,453 84	1,104 66	7,807 23	2,538 53	202 99	296 33	494 79	—	973 73	—	4 65	23 22	—	-	2,975 00	1,802 50
22. Water	254 20	—	—	—	—	—	—	—	—	—	—	254 20	—	—	—	—	—	—	—	—	—	—	—	—
23. Light and power	94,385 85	54,382 34	24,884 53	2,703 44	1,898 05	168 00	—	69 30	580 13	1,018 24	2,640 69	2,303 54	35 02	159 30	43 05	—	200 42	—	—	—	—	—	2,257 19	1,032 61
24. Janitors' supplies	24,635 52	19,696 79	3,912 30	—	—	—	—	—	140 43	99 61	463 83	212 73	—	25 31	18 57	—	58 65	—	—	—	—	7 70	—	—
25. Other expenses of operation of school plant	2,262 90	1,660 97	416 37	24 89	13 58	2 26	—	2 26	11 32	9 05	45 26	40 73	4 53	6 79	2 26	—	9 05	—	2 26	11 32	—	—	—	—
26. TOTAL FOR OPERATION	$1,114,526 42	$826,052 79	$175,749 84	$17,431 66	$11,140 60	$1,306 09	—	$2,726 83	$7,339 47	$4,665 86	$21,336 71	$9,930 41	$984 04	$1,248 64	$904 74	—	$2,958 58	—	$236 25	$1,780 26	$5,272 54	$320 10	$14,051 51	$9,089 50
EXPENSES OF MAINTENANCE OF SCHOOL PLANT.																								
27. Repairs of building and upkeep of grounds	$613,242 69	$532,016 86	$67,168 13	$141 78	$118 50	—	—	—	$2,446 49	$3,056 69	$5,544 98	$2,660 06	$27 50	—	—	—	$9 70	—	—	—	—	—	$52 00	—
28. Repair and replacement of equipment	182,012 42	154,454 85	23,786 08	154 50	58 00	—	—	—	1,431 79	452 99	1,093 42	386 30	102 49	—	—	—	87 50	—	—	—	—	—	4 50	—
29. Insurance	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
30. Other expenses of maintenance of school plant	7,449 11	6,191 78	957 48	18 00	—	—	—	—	40 00	109 70	35 50	78 65	18 00	—	—	—	—	—	—	—	—	—	—	—
31. TOTAL FOR MAINTENANCE	$802,704 22	$692,663 49	$91,911 69	$314 28	$176 50	—	—	—	$3,918 28	$3,619 38	$6,673 90	$3,125 01	$147 99	—	—	—	$97 20	—	—	—	—	—	$56 50	—
EXPENSES OF AUXILIARY AGENCIES.																								
LIBRARIES.																								
32. Salaries	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
33. Books	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
34. Other expenses	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
VOCATIONAL GUIDANCE.																								
32a. Salaries	$18,969 37	$15,175 50	$3,793 87	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
33b. Books	69 64	55 71	13 93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
34c. Other expenses	2,160 84	1,728 67	432 17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
PROMOTION OF HEALTH.																								
35. Salaries	127,499 72	115,907 74	7,496 71	$71 78	$39 15	$6 52	—	$6 52	$326 96	$1,044 68	$1,067 41	$249 45	$13 05	$197 98	$6 52	—	$191 10	—	$46 52	$367 63	$460 00	—	—	—
36. Other expenses	7,428 34	6,946 89	332 83	15 34	8 37	1 39	—	1 39	7 90	8 57	56 41	25 09	2 79	4 18	1 39	—	7 44	—	1 39	6 97	—	—	—	—
TRANSPORTATION OF PUPILS.																								
37. Salaries	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
38. Other expenses	10,315 85	5,881 03	—	—	—	—	—	—	—	3,959 82	—	—	—	—	475 00	—	—	—	—	—	—	—	—	—
39. TOTAL FOR AUXILIARY AGENCIES	$166,443 76	$145,695 54	$12,069 51	$87 12	$47 52	$7 91	—	$7 91	$334 86	$5,013 07	$1,123 82	$274 54	$15 84	$202 16	$482 91	—	$198 54	—	$47 91	$374 60	$460 00	—	—	—
MISCELLANEOUS EXPENSES.																								
40. Payments to private schools	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
41. Payments to schools of other civil divisions	$20,230 79	$19,899 29	† $296 00	—	—	—	—	—	—	—	$35 50	—	—	—	—	—	—	—	—	—	—	—	—	—
42. Care of children in institutions	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
43. Pensions *	140,840 40	119,825 92	17,736 16	—	—	—	—	—	$1,238 40	$2,039 92	—	—	—	—	—	—	—	—	—	—	—	—	—	—
44. Rent	45,054 12	24,801 10	11,080 00	—	—	—	—	—	—	—	275 32	$7,730 20	$1,167 50	—	—	—	—	—	—	—	—	—	—	—
45. Other miscellaneous expenses	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
46. TOTAL MISCELLANEOUS	$206,125 31	$164,526 31	$29,112 16	—	—	—	—	—	$1,238 40	$2,039 92	$310 82	$7,730 20	$1,167 50	—	—	—	—	—	—	—	—	—	—	—
TOTAL EXPENSES (11–46, INCLUSIVE)	$10,737,880 29	$7,648,616 12	$2,197,047 83	$72,619 69	$61,582 50	$4,956 46	$1,853 50	$15,294 63	$69,053 99	$55,248 48	$208,256 66	$164,098 91	$19,592 30	$26,255 71	$7,998 75	$1,429 16	$24,815 72	$889 95	$5,663 56	$20,863 02	$63,913 88	$5,395 18	$51,518 02	$10,916 27
II.—OUTLAYS (Capital Acquisition and Construction).																								
47. Land	$173,584 12	$133,290 34	$40,293 78	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
48. New buildings	1,322,957 37	717,871 69	605,085 68	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
49. Alteration of old buildings	30,448 97	7,738 47	22,710 50	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50. Equipment of new buildings and grounds	61,868 16	61,868 16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
51. Equipment of old buildings, exclusive of replacements	56,290 74	29,272 38	20,554 05	$452 28	$4 87	—	—	—	$282 15	$92 05	$3,093 79	$393 77	$334 80	—	—	—	$45 00	$56 00	—	—	—	—	$1,709 60	—
2. TOTAL OUTLAYS	$1,645,149 36	$950,041 04	$688,644 01	$452 28	$4 87	—	—	—	$282 15	$92 05	$3,093 79	$393 77	$334 80	—	—	—	$45 00	$56 00	—	—	—	—	$1,709 60	—

* Includes pensions to teachers and to attendance officers and janitors, etc

† Agricultural schools.

‡ Salaries of managers, leaders, conductors, etc

STANDARD REPORT ON THE FINANCIAL STATISTICS OF THE PUBLIC SCHOOLS.—Continued.

	III.— OTHER PAYMENTS.	Total.
53.	Redemption of bonds	*$210,500 00
54.	Redemption of short-term loans	—
55.	Payment of warrants and orders of preceding year	—
56.	Payments to sinking funds and for serial debt requirements	458,392 00
56a.	Payments to sinking funds, receipts from sales of real property	—
57.	Payments of interest	569,155 00
58.	Miscellaneous payments, including payments to trust funds, text-books to be sold to pupils, etc.	17,590 83
59.	Total	$1,045,137 83
60.	Balances at close of year, cash in treasury	$4,802,877 06
60a.	Stock on hand, close of year	83,851 17
61.	Total payments (sum of totals 10–59, inclusive)	13,861,693 05
61a.	Total payments and balances (60–61, inclusive)	$18,748,421 28

* Included in Item 56, therefore not added.

B. RECEIPTS.

	Revenue Receipts.	Total.
62.	Subventions and grants from state	$276,876 10
62a.	Subventions and grants from Federal Government	48,183 84
63.	Subventions and grants from county	—
64.	Subventions and grants from other civil divisions	—
65.	Appropriations from city treasury	14,756,994 50
65a.	Transferred from accrued interest, Permanent Pension Fund	—
66.	General property taxes	—
67.	Business taxes (licenses, excise taxes, taxes on corporations, taxes on occupations, etc.).	—
67a.	Dog tax (less damages by dogs)	17,149 00
68.	Poll taxes	—
69.	Fines and penalties (forfeited advance payments, evening schools)	5,981 27
70.	Rents and interest	—
71.	Tuition and other fees from patrons	15,004 94
72.	Transfers from other districts in payment of tuition	22,581 44
73.	All other revenue	19,175 28
74.	Total revenue receipts	$15,161,946 37

STANDARD REPORT ON THE FINANCIAL STATISTICS OF THE PUBLIC SCHOOLS.—Concluded.

B. RECEIPTS.— Concluded.

	Non-revenue Receipts.	Total.
75.	Loans and bond sales	—
75a.	Sinking Funds	—
76.	Warrants issued and unpaid	—
77.	Sales of real property and proceeds of insurance adjustments	—
78.	Sales of equipment and supplies	$9,120 75
79.	Refund of payments	1,400 00
80.	Other non-revenue receipts	4,000 00
81.	Total non-revenue receipts	$14,520 75
82.	Total receipts (sum of 74 and 81)	$15,176,467 12
83.	Balance at beginning of year, cash in treasury	3,472,612 53
83a.	Credit money refunded	—
83b.	Stock on hand, beginning of year	99,341 63
84.	Total receipts and balances (82-83b, inclusive)	$18,748,421 28

C. VALUE OF SCHOOL PROPERTY.

Class of Buildings.	Total Value of Sites, Buildings and Equipment.	Value of Sites and Buildings.	Value of Equipment.	Interest on Value of School Plant.
General control	$639,000 00	$631,000 00	$8,000 00	—
Elementary schools	22,297,959 72	21,531,089 26	766,870 46	—
Secondary schools	6,280,012 19	5,928,225 00	351,787 19	—
Normal schools	403,275 00	387,075 00	16,200 00	—
Schools for the industries	610,288 26	476,631 64	133,656 62	—
Special schools	101,300 00	98,000 00	3,300 00	—

D. EXPENDITURES, INCOME FROM TRUST FUNDS.

	Total.
Bowdoin (Dorchester School Fund)	$191 26
Eastburn School Fund	435 00
Franklin Medal Fund	35 00
Gibson School Fund	3,318 86
Horace Mann School Fund	307 00
Peter P. F. Degrand School Fund	1,174 26
Teachers' Waterston Fund	144 00
Charlestown Free School Fund	420 53
Total	$6,025 91

TEXT-BOOKS.

TEXT-BOOKS LOST.

The number of text-books reported lost during the year was as follows:

High schools	1,384
Elementary schools	3,699
Evening schools	1,127
Special schools	148
Total number reported lost	6,358
The average number reported lost each year since 1885–86 (a period of thirty-six years) was 4,101, a total for the thirty-six years of	141,298
Total number of books lost in thirty-seven years	147,656

The number of books in addition to the above lost and paid for, but which were not reordered by schools, was 1,533.

TEXT-BOOKS RETURNED.

The number of text-books returned from the schools as worn out during the year was as follows:

High schools	15,519
Elementary schools	75,804
Evening schools	—
Special schools	14
Total number reported worn out	91,337
The average number reported worn out each year since 1885–86 (a period of thirty-six years) was 55,127, a total for the thirty-six years of	1,984,600
Total number of books worn out in thirty-seven years	2,075,937

In addition, 16,749 books were returned by principals as not being wanted.

BOOKS DESTROYED.

During the year 3,051 books were destroyed for fear of contagion.

TEXT–BOOKS GIVEN TO PUPILS.

During the year 3,742 copies of Morris's Household Science and Arts were retained by pupils completing the course in elementary schools.

TOTALS.

Since the free text-book law went into effect the schools have been supplied with 4,168,990 text-books. Of this number 1,328,687 are still in use in the schools, and the balance 2,840,303 either have been lost or returned to the supply room as worn out or displaced.

TEXT–BOOKS CHARGED TO ELEMENTARY SCHOOLS JANUARY 1, 1922.

Adams: Elementary Commercial Geography	4,862
Aldrich: Selections from	45
Aldrich & Forbes: Progressive Course in Reading, Book I	980
" " " " " Book II	2,412
" " " " " Book III	2,950
" " " " " Book IV	138
Aldrich & Forbes: Progressive Course in Reading, Book IV, Part 1	1,162
Aldrich & Forbes: Progressive Course in Reading, Book IV, Part 2	1,061
Aldrich & Forbes: Progressive Course in Reading, Book V	48
Aldrich & Forbes: Progressive Course in Reading, Book V, Part 1	841
Aldrich & Forbes: Progressive Course in Reading, Book V, Part 2	818
Aldrich & Foster: French Reader	518
Alexander: Spelling Book, Part I	2,900
" " " Part II	5,488
Armand: Grammaire Elementaire	1,414
Arnold Primer	2,415
Arnold & Gilbert: Stepping Stones to Literature, First Reader	2,929
" " " " " Second Reader,	4,140
" " " " " Third Reader	3,980
" " " " " Fourth Reader,	2,480
Arnold & Gilbert: Stepping Stones to Literature, Fifth Grade Reader	1,515
Arnold & Gilbert: Stepping Stones to Literature, Sixth Grade Reader	1,151
Arnold & Gilbert: Stepping Stones to Literature, Seventh Grade Reader	1,542
Carried forward	45,789

Brought forward	45,789
Arnold & Gilbert: Stepping Stones to Literature, Higher Grades,	896
Bacci & Gotti: Le Gloria della Patri	45
Bacon: New German Grammar for Beginners	33
Bailey-Manly Spelling Book, Part I	4,368
" " " " Part II	7,283
Baldwin: Stories of the King	55
Baldwin & Bender: First Reader	730
" " Second Reader	1,148
" " Third Reader	1,754
" " Fourth Reader	1,648
" " Fifth Reader	1,006
" " Sixth Reader	375
" " Seventh Reader	481
" " Eighth Reader	113
Ballard: Short Stories of Oral French	134
Ballard & Stewart: Short Stories for Oral Spanish	90
Bassett: Plain Story of American History	615
Bemis: Patriotic Reader	399
Bender: The Bender Primer	716
Bennett: Master Skylark	169
Bertenshaw: Longmans' Modern French Course, Part I	423
Bierman & Frank: Conversational French Reader for Beginners	132
Blaisdell: Child's Book of Health	610
" Our Bodies and How We Live	567
" Child Life Primer	4,536
" Second Reader	5,838
" Third Reader	2,866
" Fourth Reader	2,271
Blodgett: Primer	3,199
" First Reader	1,718
Bloomfield: Farmer Boy, Modern Classics No. 31, etc	45
Bolemius: Every day English Composition	149
Boyden: First Book in Algebra	500
Brigham & McFarlane: Essentials of Geography, First Book	7,859
" " " " Second Book	10,022
Brooks: English Composition, Book I	257
Brown: The Plant Baby and Its Friends	125
Browne & Haldeman: Clarendon Dictionary	10,901
Bruce: Lectures Faciles	618
Brumbaugh: Standard Fourth Reader	1,403
" Standard Fifth Reader	1,158
Bryce & Spaulding: Aldine First Language Book, Part I	2,324
" " " " " " Complete	1,203
" " " Second Language Book	553
Buckwalter: Easy Primer,	168
" " " Part I	83
" " " Part II	71
" " First Reader	639
Carried forward	128,085

Brought forward	128,085
Buckwalter: Easy Second Reader	1,389
" " Third Reader	1,772
" " Fourth Reader	2,874
" " Fifth Reader	1,137
Buehler & Hotchkiss: Modern English Lessons, Book I	524
Burchill, Ettinger & Shimer: Progressive Road to Reading, Book I	3,435
Burchill, Ettinger & Shimer: Progressive Road to Reading, Book II	4,366
Burchill, Ettinger & Shimer: Progressive Road to Reading, Introductory Book III	1,728
Burchill, Ettinger & Shimer: Progressive Road to Reading, Book III	2,465
Burchill, Ettinger & Shimer: Progressive Road to Reading, Introductory Book IV	599
Burchill, Ettinger & Shimer: Progressive Road to Reading, Book IV	887
Burns: Cotter's Saturday Night and Other Poems	45
Burns's Poems	49
Capus: Pour Charmer Nos Petits	357
Carroll & Brooks: Primer	596
" " First Reader	1,309
Chancellor: Reading and Language Lessons	58
Channing: Elements of United States History	274
" Short History of the United States	1,102
Chapuzet & Daniels: Mes Premiers Pas en Français	2,587
Chardenal: The New Chardenal	690
Claude: Twilight Thoughts	345
Coe: School Reader, Third Grade	1,491
" " " Fourth Grade	1,940
Coe & Christie: Story Hour Reader III	924
Cole: Graded Arithmetic, Book III	657
" " " Book IV	778
" " " Book V	335
" " " Book VI	444
" " " Book VII	401
Congdon: Music Primer, No. 1	1,537
" " " No. 2	425
Conn: Introductory Physiology and Hygiene	8,068
" Elementary Physiology and Hygiene	8,036
Cooley: Elements of Natural Philosophy	1
Cooper: The Spy	209
Culler: First Book in Physics	2,533
Cunningham: First Book for Non-English Speaking People	668
Cyr: Children's Primer	7,279
" " First Reader	3,843
" " Second Reader	4,309
" " Third Reader	4,077
Carried forward	204,628

Brought forward	204,628
Cyr: Children's Fourth Reader	4,581
" " Fifth Reader	2,377
Daly: Advanced Rational Speller	1,396
Davis: Seulette	132
Davison & Surette: Book of Words to Rote Songs, Grades I, II, III,	15,251
De Amicis: Cuore	393
DeMonvert: La Belle France	373
DeSegur: Mes Malheurs de Sophie	93
D'Ooge: Latin for Beginners	78
Dopp's: Early Sea People	10
Dowling: Reading, Writing and Speaking Spanish for Beginners,	892
Driggs: Live Language Lessons, Third Book	916
Dryer: Elementary Economic Geography	503
DuCroquet: Le Français parla Conversation, 8th Edition	90
Dunn: The Community and the Citizen	733
Dunton & Kelley: Graded Course in English, First Book	1,512
" " " " " Language Lessons,	1,215
Dunton & Kelley: Inductive Course in English, Language Lessons	894
Durrell & Hall: Arithmetic, Book I	501
" " " Book II	676
" " " Book III	502
Edson-Laing: Reader I	331
" Reader II	799
" Reader III	1,051
" Reader IV	533
" Reader V	560
Elson: Elson Primary School Reader, Book I	930
" " " " " Book II	1,673
" " " " " Book III	2,005
" " " " " Book IV	1,074
Elson & Keck: Elson Grammar School Reader, Book I	717
" " " " " " Book II	1,409
" " " " " " Book III	2,019
" " " " " " Book IV	1,914
Elson & Runkel: Primer	1,101
Enekel: New Dictionary of the English and Italian Languages	149
Espinosa: Elementary Spanish Reader	217
Evans & Marsh: First Year Mathematics	1,125
Fall: Science for Beginners	250
Fassett: The Beacon Primer	5,147
" " " First Reader	4,074
" " " Second Reader	3,643
" " " Third Reader	2,244
Fick: Dies and Das	109
Finch Primer	1,216
Fiske: History of United States for Schools	705
Foster: Geschichten und Märchen	323
Carried forward	273,064

Brought forward	273,064
Franklin Arithmetics	628
" Readers	642
Frazer: Scenes of Child Life in Colloquial French	127
Frye: Leading Facts in Geography, Book I	2,785
" " " " Book II	1,160
Funk & Wagnalls: Comprehensive Standard Dictionary	3,065
" " Concise Standard Dictionary	5,361
Gifford: Elementary Lessons in Physics	988
" Progressive Mental Arithmetic, Book I	4,308
" " " " Book II	3,254
Gilbert & Harris: Guide Book to English, Book I	1,655
Gordy: Elementary History of the United States	2,767
" History of the United States for Schools	2,173
Griffith: Essentials of Woodworking	110
Gronow: Jung Deutschland	127
Guerber: Contes et Légendes, Part I	1,108
" Märchen und Erzahlungen, Part I	384
Hale: Man Without a Country and Other Stories	358
Hall: All Spanish Method, First Book	165
Hall & Brumbaugh: Standard Primer	74
Hamilton: Standard Arithmetic, Book I	171
" " " Book II	475
" " " Book III	328
Hanson: English Composition	98
Hapgood: School Needlework	61
Harris & Gilbert: Guide Book to English, Book I	446
Harris & Waldo: First Journeys in Numberland	522
Harry: French Anecdotes	5
Hartwell, McGlenen & Skelton: Boston and Its Story	300
Hazen: Fourth Reader	1,397
Heath: Primer	906
" First Reader	967
" Second Reader	2,016
" Third Reader	1,945
" Fourth Reader	1,690
" Fifth Reader	1,351
Hervey & Hix: Horace Mann Primer	297
" " " " Reader I	343
" " " " Reader II	433
" " " " Reader III	680
" " " " Reader IV	1,289
" " " " Introductory Fourth Reader	45
Hessler's Junior Science	531
Hicks: Champion Spelling Book, Part I	522
" " " " Part II	636
" " " " Complete	85
Higgins: Lessons in Physics	1,934
Hills & Ford: First Spanish Course	350
Carried forward	324,126

Brought forward	324,126
Hitchcock: New Practice Book in English Composition	1,664
" Junior English	967
Holmes & Gallagher: Composition and Rhetoric	46
Howe: Primer	1,276
" First Reader	1,141
" Second Reader	1,829
" Third Reader	1,645
" Fourth Reader	2,938
" Fifth Reader	2,887
" Reader, Book VI	871
" " Book VII	1,358
" " Book VIII	913
Hoyt & Peet: Everyday Arithmetic, Book I	343
" " " " Book II	1,091
" " " " Book III	618
" " First Year in Number	386
Huebsch & Smith: Progressive Lessons in German	93
Hughes: Community Civics	211
Hunt: Geometry	153
" Simple Problems in Industrial Arithmetic	75
James & Sanford: Our Government, Local, State and National	3,455
Jones: First Reader	2,343
" Second Reader	4,020
" Third Reader	4,476
" Fourth Reader	3,428
" Fifth Reader	2,019
" The Child's Own Spelling Book	98
Joynes: French Fairy Tales	93
Judson & Bender: Graded Literature Readers, First Book	221
" " " " " Second Book	329
" " " " " Third Book	480
" " " " " Fourth Book	447
" " " " " Fifth Book	45
Kelley & Morse: Natural Speller, Book I	2,146
" " " " Book II	1,205
King: Elementary Geography	5,629
" Advanced Geography	3,378
Kittredge: Practical Homemaking	1
Krohn: First Book in Physiology and Hygiene	4,213
" Graded Lessons in Physiology and Hygiene	4,903
" & Crumbine: Graded Lessons in Physiology and Hygiene,	386
Lewis: Lippincott Primer	487
" " First Reader	441
" " Second Reader	810
Lincoln: Boston School Kitchen Text-book	244
Lister: Writing Lessons for Primary Grades	31,685
Lohmeyer: Der Geissbub von Engelberg	80
Macaulay: Lays of Ancient Rome	170
Carried forward	421,863

Brought forward	421,863
Macdermott: Lectura Natural de Heath, Libro Primero	198
" " " " " Segundo	124
" " " " " Tercero	49
McLaughlin & Gilchrist: New Educational First Music Reader	10,442
McLaughlin & Gilchrist: New Educational Second Music Reader	5,304
McLaughlin & Gilchrist: New Educational Third Music Reader	5,935
McLaughlin & Gilchrist: New Educational Fourth Music Reader	4,782
McLaughlin & Gilchrist: New Educational Fifth Music Reader	4,007
McLaughlin & Van Tyne: History of the United States	563
McLaughlin & Van Tyne: History of United States for Schools, Vol. I	191
McLaughlin & Van Tyne: History of United States for Schools, Vol. II	86
McMaster: Brief History of the United States	715
Mace: School History of the United States	283
Mairet: La Tache du Petit Pierre	45
Marshall: Business Speller and Technical Word Book	46
Mason & Veazie: National Fourth Music Reader	224
Masterpieces of American Literature	4,402
Meras: Le Petit Vocabulaire	46
" Le Premier Livre	1,893
Meras & Roth: Petits Contes de France	138
" " Pequeno Vocabulario	591
Meservey: Bookkeeping, Single Entry	78
Metcalf: English Grammar	781
" Language Exercises	251
Metcalf & Bright: Language Lessons, Part I	1,285
" " " " Part II	1,538
Metcalf & Rafter: Language Series, Book I	22,839
" " " " Book II	17,553
Mickens & Robinson: Mother Goose Reader	1,141
Miller: Practical English Composition, Book I	44
Miller & Meras: Ein Wortschatz	93
Mims: The Van Dyke Book	220
Mitchell: Public School Class Method for Violin, Book I	474
" " " " " " Book II	288
Monroe: New Fourth Reader	1,347
Montgomery: Elementary American History	6,602
" Leading Facts of American History	9,848
Moore: Second Book for Non-English Speaking People	264
Morey: Elementary Arithmetic, Part I	26
" " " Part II	110
" " " Part III	110
" Advanced Arithmetic, Part I	142
" " " Part II	132
" Advanced Arithmetic, Part III	183
Carried forward	527,276

Brought forward	527,276
Morey: Outlines of Greek History	196
Morris: Household Science and Arts	13,806
Moulton: Short Stories	591
Mowry: Elements of Civil Government	273
Murray Wide Awake Junior	669
" " " Primer	5,668
" " " First Reader	4,840
" " " Second Reader	5,091
" " " Third Reader	3,418
" " " Fourth Reader	2,142
Myers: Ancient History, Rev. Ed.	140
" Arithmetic, Book I	201
" " Book II	482
" " Book III	342
Nichols: New Graded Lessons in Arithmetic, Book II	468
" " " " " Book III	4,748
" " " " " Book IV	5,742
" " " " " Book V	3,720
" " " " " Book VI	3,841
" " " " " Book VII	3,255
" " " " " Book VIII	2,219
Noyes & Guild: Sunshine Primer	389
Palmer Method of Business Writing	3,077
Palmer Method of Business Writing: Business and High School Edition	77,331
Patton: Causeries en France	7,597
Pearson: Essentials of Latin for Beginners	465
Pelo & Gardner: Sanborn Speller, Part I	46
" " " " Part II	268
" " " " Part III	45
Perkins: Beginning Latin Book	143
Pichon: Premiers Lecons de Vocabulaire et d'Elocution	161
Pichon-Sattler: Deutsches Lese und Redebuch	378
Powell: The Narrative Poems of Longfellow	100
Redway & Hinman: Natural Introductory Geography	1,817
" " " School Geography	2,056
Reinsch: Civil Government	252
Ripley & Tapper: Natural Music Readers, Old Edition	2,358
" " " Harmonic Primer	6,102
" " " " First Music Reader	3,686
" " " " Second Music Reader	3,072
" " " " Third Music Reader	3,172
" " " " Fourth Music Reader	3,342
" " " " Fifth Music Reader	1,132
Ritchie: Fabulae Faciles	337
" Primer of Sanitation	2,226
Ritchie & Caldwell: Primer of Hygiene	4,027
" " " " Physiology	484
Carried forward	713,191

Brought forward	713,191
Robbins, Dressel & Graff: New Barnes Readers, Book I	105
" " " " " Primer	76
Scott: Elementary Latin	143
Scott & Denny: Elementary Composition	136
Scott & Southworth: Lessons in English, Book I	5,434
Seeligmann: Altes und Neues, An Easy German Reader for Beginners, Revised	95
Sensenig-Anderson: Introductory Arithmetic	301
" " Essentials of Arithmetic	803
Shakespeare: As You Like It	185
" Midsummer Night's Dream	458
" Tempest	341
Sheldon-Barnes: American History	308
Snow & Lebon: Easy French	50
Solano: Class-Room Spanish	954
Southworth: A First Book in American History with European Beginnings	446
Southworth & Paine: Bugle Calls of Liberty	338
Southworth & Stone: Exercise Book in Arithmetic	531
Spaulding & Bryce: Aldine Primer	5,156
" " " First Reader	4,640
" " " Second Reader	3,876
" " " Third Reader	3,704
" " " Fourth Grade Reader	1,421
" " " Fifth Grade Reader	599
" " " Sixth Grade Reader	463
" " " Seventh Grade Reader	518
Spink: French Plays for Children	197
Spyri: Moni der Geissbub	20
Stone: History of England	105
Stone-Millis: Arithmetic, Primary Book	4,567
" " " Intermediate Book	8,893
" " " Advanced Book	7,171
Stowell: Healthy Body	196
Summers: Primer	212
" First Reader	208
" Second Reader	355
Swinton: Language Lessons	3
Talbot: Le Français et sa Patrie	173
Tappan: Our Country's Story	2,550
Tarbell: Introductory Geography	1,401
" Complete Geography	1,488
Tarr & McMurry: Geography, Book I, Part 1	1,039
" " " Book I, Part 2	741
" " " Book I, Complete	7,671
" " " Book II, Part 1	2,020
" " " Book II, Part 2	1,331
" " " Book II, Complete	12,922
Carried forward	797,535

Brought forward	797,535
Tarr & McMurry: Geographies, old edition	408
Thwaites & Kendall: History of the United States for Grammar Schools	1,660
Tuell & Fowler: First Book in Latin	113
Tufts: Cecilian Series of Study and Song, Book III	1,453
" " " " " Book IV	1,058
Tufts: Cecilian Series of Study and Song, Books III and IV, combined	746
Tufts & Holt: New Normal First Music Reader	7,518
" " " " Second Music Reader, Part 1	957
" " " " " " " Part 2	586
" " " " " " " Complete	3,403
" " " " Third Music Reader, Part 1	2,859
" " " " " " " Part 2	684
" " " " " " " Complete	1,004
Van Buskirk & Smith: The Science of Everyday Life	248
Van Sickle, Seegmiller & Jenkins: Riverside Primer	376
" " " Riverside First Reader	446
" " " Riverside Second Reader	1,479
" " " Riverside Third Reader	1,297
" " " Riverside Fourth Reader	815
" " " Riverside Fifth Reader	757
" " " Riverside Sixth Reader	415
Van Tuyl: Essentials of Business Arithmetic	1,572
Varney: Robin Reader	2,446
Vosburgh & Gentleman: Junior High School Mathematics, First Course	5,450
Vosburgh & Gentleman: Junior High School Mathematics, Second Course	3,657
Vosburgh & Gentleman: Junior High School Mathematics, Third Course	14
Wallach: First Book in English for Foreigners	122
" Second Book in English for Foreigners	76
Walsh & Suzzallo: Arithmetic, Book I	349
" " " Book II	929
" " " Book III	516
Walton & Holmes: Arithmetic, Book I	4,593
" " " Book II	8,746
" " " Book III	7,645
" " " Book IV	3,418
Ward: Sentence and Theme	535
" Punctuation Leaves for above	310
Webster: Academic Dictionary	2,798
" Elementary School Dictionary	1,685
" Shorter School Dictionary	1,644
Wentworth & Smith: Arithmetic, Book I	288
" " " Book II	1,306
" " " Book III	514
Carried forward	874,430

Brought forward	874,430
Wentworth & Smith: Essentials of Arithmetic, Primary Book	50
" " Essentials of Arithmetic, Intermediate Book	97
Wentworth & Smith: Essentials of Arithmetic, Advanced Book	1
Werner: Primer	340
Williams & Fisher: Elements of the Theory and Practice of Cookery	16
Woodburn & Moran: Elementary American History and Government	5,394
Wood: Practical Grammar and Composition	110
Worcester: New Primary Dictionary	3,243
" Comprehensive Dictionary	17,490
Worcester: New Pronouncing Speller	716
" New School Dictionary of the English Language	122
Young & Jackson: Appleton Arithmetic, Primary	584
" " " " Second Book	908
" " " " Third Book	463
Miscellaneous books in Hyde Park schools	2,647
Total	906,611

SUMMARY TEXT-BOOKS CHARGED TO SCHOOLS JANUARY 1, 1922.

Normal, Latin and high schools	376,996
Elementary schools	906,611
Boston Clerical School	2,283
Horace Mann School	1,571
Trade School for Girls	435
Boston Trade School	2,917
Continuation schools	506
Day School for Immigrants	350
Classes for Conservation of Eyesight	255
Speech Improvement classes	3,460
Boston Disciplinary Day School	270
Evening schools	33,033
Total	1,328,687

This shows a net increase of 12,997 books during the year.

BUDGET AND ITEMIZED APPROPRIATION ORDERS WITH DETAILED ESTIMATES FOR THE FINANCIAL YEAR 1922-23.

BUDGET.

Appropriations, 1922–1923.

Office of the Business Agent of the School Committee,
Room 51, 15 Beacon Street, April 24, 1922.

To the School Committee:

In compliance with paragraph 2 of section 99 of the rules, I submit herewith the estimates and itemized appropriation order to cover the expenses of the public schools for the financial year February 1, 1922, to January 31, 1923, both included.

These estimates show the cost of maintenance of the public schools on the basis existing December 1, 1921, and the costs of any provisions for growth or expansion of any kind are set forth separately.

Under the established practice for a great many years the salaries for the month of January and the bills for the months of December and January have been paid out of the appropriation for the financial year beginning on the first of February following. Under a recent decision of the Corporation Counsel, all liabilities contracted within the financial year must be provided for out of the revenue for the year.

Such a change in accounting methods would necessitate either the payment of the salaries for thirteen months and the bills for fourteen months out of the appropriations for one year, or the salaries for the month of January and the bills for the months of December and January must be cared for out of some special fund set up for the purpose.

The City Auditor, with the approval of the Mayor, has set aside a fund called the "Special Account 1921–22" to be used during the current year for taking care of the salaries for the month of January, 1922, and the bills for December, 1921 and January, 1922, and any other unpaid accounts for the financial year 1921–22, with the understanding that the School Committee shall contribute thereto all of its unexpended balances for the past financial year.

Beginning February 1, 1922, estimates will be based upon the liabilities incurred during the financial year, and each financial year thereafter the appropriations are to be made for the obligations entered into during the financial year.

The immediate effect of this change of methods on the budget for the financial year 1922–23 will be to reduce the appropriating power of the School Committee by the amount of the unexpended balance for the past financial year and the excess of income for that year over the amount estimated.

The average valuation of the city for the three years 1919, 1920 and 1921, with all abatements allowed up to December 31, 1921, as certified to his Honor the Mayor by the Board of Assessors, is $1,557,388,410.46. This is the sum upon which all appropriations by the City Council and the School Committee for the financial year 1922–23 are based.

The School Committee is authorized by law to appropriate the following sums:

(*a.*) Six dollars and thirty cents upon each one thousand dollars of the valuation of the city for general school purposes. (Chapter 206 of the Special Acts of 1919, chapter 249 of the Special Acts of 1919, and chapter 641 of the Acts of 1920.)

(*b.*) One dollar and sixty-three cents upon each one thousand dollars of the valuation of the city for the construction and furnishing of new school buildings, both temporary and permanent, including the taking of land therefor, and for school yards and the preparing of school yards for use, and for the rent of hired school accommodations. (Chapter 206 of the Special Acts of 1919 and chapter 524 of the Acts of 1920.)

(*c.*) Eighty-four cents upon each one thousand dollars of the valuation of the city for the alteration and repair of school buildings, and for furniture, fixtures and means of escape in case of fire, and for fire protection for existing buildings, and for improving existing school yards. (Chapter 206 of the Special Acts of 1919 and chapter 524 of the Acts of 1920.)

(*d.*) Eleven cents upon each one thousand dollars of the valuation of the city for organizing and conducting physical training and exercises, athletics, sports, games and play, and for providing apparatus, equipment and facilities for the same in buildings, yards and playgrounds under the control of the School Committee, or upon any other land which the committee may have the right to use for this purpose, under the provisions of chapter 295 of the Acts of 1907. (Chapter 206 of the Special Acts of 1919, chapter 249 of the Special Acts of 1919, and chapter 641 of the Acts of 1920.)

(*e.*) Nine cents upon each one thousand dollars of the valuation of the city for the employment of one supervising female nurse and so many district female nurses as, in the opinion of said committee, are necessary in accordance with the provisions of chapter 357 of the Acts of 1907, and for the employment of such number of school physicians as, in the opinion of the School Committee, may be necessary, and for the care of the teeth of school children. (Chapter 206 of the Special Acts of 1919, chapter 249 of the Special Acts of 1919, and chapter 641 of the Acts of 1920.)

(*f.*) Three cents upon each one thousand dollars of the valuation of the city for the purpose of conducting educational and recreative activities in or upon school property under the control of the School Committee, and the use thereof by individuals and associations in accordance with the provisions of chapter 195 of the Acts of 1912 and chapter 86 of the Special Acts of 1916. (Chapter 206 of the Special Acts of 1919 and chapter 641 of the Acts of 1920.)

(*g.*) Seven cents upon each one thousand dollars of the valuation of the city for the payment of pensions to members of the teaching or supervising staff of the public schools of the city, and to persons who were annuitants of the Boston Teachers' Retirement Fund at the time when chapter 589 of the Acts of 1908 took effect, and other teachers who had retired prior to said time, in accordance with the provisions of said chapter 589, chapter 537 of the Acts of 1909, chapter 617 of the Acts of 1910, chapter 569 of the Acts of 1912, and acts in amendment thereof, and of the provisions of chapter 206 of the Special Acts of 1919. (Chapter 206 of the Special Acts of 1919.)

(*h.*) Two cents upon each one thousand dollars of the valuation of

the city for promoting the Americanization and better training for citizenship of foreign-born persons. (Chapter 206 of the Special Acts of 1919.)

(*i.*) Two cents upon each one thousand dollars of the valuation of the city for vocational guidance. (Chapter 206 of the Special Acts of 1919.)

(*j.*) The unexpended balance for the financial year 1921–22. (None available this year.)

(*k.*) The excess of income, if any, for the financial year 1921–22 over that estimated. (None available this year.)

(*l.*) The estimated income for the financial year 1922–23.

(*m.*) Estimated allotment, Smith-Hughes Fund, 1922–23.

TOTAL MONEY AVAILABLE 1922–23.

Exclusive of the money available for new school buildings, lands, yards and furnishings, viz., one dollar and sixty-three cents on each one thousand dollars of the valuation and amounting to $2,538,543.11, the sums available for the financial year 1922–23 are as follows:

$6.30 per $1,000 for general school purposes	$9,811,546 98
.84 per $1,000 for the alteration and repair of school buildings	1,308,206 26
.11 per $1,000 for physical education	171,312 72
.09 per $1,000 for school physicians and nurses	140,164 96
.03 per $1,000 for extended use of the public schools	46,721 65
.07 per $1,000 for pensions to teachers	109,017 18
.02 per $1,000 for promoting Americanization	31,147 76
.02 per $1,000 for vocational guidance	31,147 77
Unexpended balance general appropriation 1921–22	*
Unexpended balance appropriation Schoolhouse Department, 1921–22	*
Excess of income over amount estimated	—
Estimated income 1922–23	364,000 00
Estimated income 1922–23, physical education	3,000 00
Estimated income 1922–23, extended use of the public schools	7,500 00
Smith-Hughes Fund (estimated allotment)	25,673 04
Total amount available	$12,049,438 32

In compliance with the instructions of your Board, the appropriation for the alteration and repair of school buildings, etc., has been separated from the general appropriation order and has been made the subject of another communication.

The amounts as set forth in the following estimates should be appropriated, and I recommend the passage of the accompanying order which carries this intention into effect.

WILLIAM T. KEOUGH,
Business Agent.

* Unexpended balance of general appropriation, $168,962.02, and of appropriation Schoolhouse Department, $23,161.50, will not be available for appropriation this year for the reason that these sums have been diverted to the "Special Account 1921–1922," which fund is being used in making the change in the accounting methods of the city.

ESTIMATES FOR FINANCIAL YEAR, 1922–23.

Salaries of Instructors.

Normal School.

Normal School	$55,136 06	
Assignment of master, head of department, to Training School of Mechanic Arts	87 50	
		$55,223 56

Latin and High Schools.

Public Latin	$110,431 04	
Girls' Latin	73,599 16	
Brighton High	50,440 40	
Charlestown High	54,905 87	
Dorchester High	189,570 64	
East Boston High	70,438 22	
English High	225,091 04	
Girls' High	156,667 96	
High School of Commerce	160,361 16	
High School of Practical Arts	102,927 94	
Hyde Park High	80,246 94	
Mechanic Arts High	191,879 90	
Roxbury High	95,093 65	
South Boston High	80,665 13	
West Roxbury High	78,912 19	
Laboratory assistance, English High	600 00	
Laboratory assistance, Girls' High	500 00	
Lectures, High School of Commerce	100 00	
Temporary teachers	57,474 00	
6 assistants (vacancies)	10,008 00	
10 assistants (vacancies) from February 15	15,790 40	
15 assistants (vacancies) from September 13	11,676 00	
	$1,817,379 64	
Reduction in estimates	25,000 00	
		$1,792,379 64

Elementary School Districts (Including Kindergarten Teachers)

Abraham Lincoln	$104,610 98
Agassiz	43,332 13
Bennett	88,889 21
Bigelow	50,180 16
Blackinton-John Cheverus	80,318 14
Bowditch	61,712 32
Bowdoin	52,261 71
Bunker Hill	39,761 46

Chapman	$63,383 05
Charles Sumner	60,696 33
Christopher Gibson	53,684 08
Dearborn	97,451 49
Dillaway	62,961 18
Dudley	69,959 36
Dwight	49,269 77
Edmund P. Tileston	49,030 19
Edward Everett	84,743 92
Elihu Greenwood	68,231 35
Eliot	127,252 85
Emerson	70,318 95
Everett	42,125 89
Francis Parkman	40,094 81
Franklin	60,999 78
Frederic W. Lincoln	41,328 55
Gaston	54,367 57
George Putnam	73,106 60
Gilbert Stuart	44,196 73
Hancock	134,395 44
Harvard–Frothingham	70,027 46
Henry Grew	40,804 02
Henry L. Pierce	96,222 90
Hugh O'Brien	81,392 57
Hyde	44,160 96
Jefferson	77,532 13
John A. Andrew	50,500 47
John Marshall	69,821 67
John Winthrop	84,667 81
Julia Ward Howe	55,275 60
Lawrence	46,040 99
Lewis	80,154 70
Longfellow	68,719 20
Lowell	65,565 12
Martin	46,647 95
Mary Hemenway	111,221 84
Mather	126,943 94
Minot	30,413 27
Norcross	61,930 64
Oliver Hazard Perry	46,955 58
Oliver Wendell Holmes	60,756 03
Phillips Brooks	84,384 98
Prescott	40,544 81
Prince	53,741 19
Quincy	74,624 68
Rice	52,273 16
Robert G. Shaw	68,523 88
Roger Wolcott	138,249 24
Samuel Adams	119,743 75
Sherwin	63,231 40

Shurtleff	$43,973 63	
Theodore Lyman	77,813 95	
Thomas Gardner	79,177 29	
Thomas N. Hart	61,851 70	
Ulysses S. Grant	76,195 04	
Warren	54,720 94	
Washington	93,380 29	
Washington Allston	63,986 65	
Wells	96,825 19	
Wendell Phillips	76,892 52	
William E. Endicott	106,276 32	
William E. Russell	57,173 30	
William Lloyd Garrison	49,751 83	
Allowance for special and emergency assistants	272,582 00	
Assignment of Marie A. Solano to supervision of language work in intermediate classes	504 00	
74 assistants (vacancies)	114,592 00	
Promotions (7) from assistants to masters' assistants, first assistants in charge and first assistants, grammar	11,250 00	
18 assistants, kindergarten (vacancies), from September 13	9,072 00	
5 additional assistants, kindergarten, from September	2,700 00	
Promotions (5) from assistants, kindergarten, to first assistants, kindergarten	150 00	
6 prevocational assistants (vacancies), from September 13	4,468 80	
4 instructors, special classes (vacancies), from September 13	2,576 00	
6 additional instructors, special classes, from September	5,292 00	
Pupil clerical assistance	4,000 00	
7 clerical assistants, from September	3,444 00	
	$5,348,385 39	
Reduction in estimates	59,549 98	
		$5,288,835 41

Horace Mann School.

Principals and teachers	$34,407 73	
Assistants assigned to afternoon classes in lip reading in day schools	210 00	
		$34,617 73

Trade School for Girls (Day, Extension and Summer Classes).

Master, teachers and clerks	$77,119 62	
4 Emergency Trade Assistants	3,640 00	

5 Student Aids	$2,540 00	
9 Aids	8,188 50	
	$91,488 12	
Reduction in estimates	1,436 00	
		$90,052 12

Boston Trade School.

Master, teachers and clerks, day school (existing force)	$71,479 23	
2 Tool keepers	1,274 50	
3 Apprentice Helpers	2,513 00	
5 Temporary Shop Instructors	7,280 00	
3 Temporary Senior Instructors	3,822 00	
2 Temporary Shop Foremen	3,640 00	
	$90,008 73	
Reduction in estimates	1,852 00	
		88,156 73

Boston Clerical School.

Head-master and teachers	$24,162 64	
Temporary teachers	2,250 00	
		26,412 64

Boston Disciplinary Day School.

Teachers	6,575 76

Department of Manual Arts.

Director	$3,996 00	
Associate Director	3,686 00	
3 Assistant Directors	9,700 00	
1 Acting Assistant Director	3,468 00	
2 First Assistants	5,341 60	
8 Assistants	18,443 09	
8 Shop Foremen	18,720 00	
3 Foremen, Shop Work	7,020 00	
11 Instructors in Manual Training	23,827 43	
35 Assistant Instructors in Manual Training	71,791 51	
17 Shop Instructors	36,616 32	
5 Shop Instructors, from September	4,536 00	
14 Instructors, Shop Work	28,650 08	
4 Instructors, Shop Work, from September	3,528 00	
1 Instructor in Manual Arts, assigned	2,191 92	
1 Prevocational Assistant, assigned	2,460 00	
1 Assistant Instructor in Manual Training, one-half time	1,029 56	
3 Temporary Shop Instructors	3,731 00	
4 Temporary Shop Instructors, to August 31,	2,880 00	
1 Temporary Shop Instructor, four-fifths time, to August 31	576 00	

1 Temporary Assistant Instructor, to August 31	$540 00	
1 Temporary Shop Instructor, on four-fifths time	1,164 80	
Instructors in Gardening, Supervisors of Gardening and Assistant Supervisors of Gardening	9,150 00	
3 Vocational Art Instructors (Art Museum) on part time, and 1 Monitor on half time,	1,600 00	
Instructors in Recreational Handicrafts	798 00	
Promotion, from Instructor, Shop Work to Foreman	30 00	
Assignment of First Assistant to Training School of Mechanic Arts	87 50	
	$265,562 81	
Reduction in estimates	889 00	
		$264,673 81

Department of Household Science and Arts.

Director	$3,396 00	
Assistant Director	2,292 00	
Industrial Instructor, high schools, assigned	2,201 87	
43 Teachers of Cookery	78,945 84	
2 additional Teachers of Cookery, from September	1,200 00	
65 Teachers of Sewing	119,385 19	
5 additional Teachers of Sewing, from September	3,000 00	
2 Trade Assistants, from September	1,728 00	
Temporary Teachers, Cookery	4,700 00	
Temporary Teachers, Sewing	8,460 00	
	$225,308 90	
Reduction in estimates	1,316 00	
		223,992 90

Department of Music.

Director	$3,996 00	
4 Assistant Directors	12,720 00	
1 additional Assistant Director, from September	1,258 00	
9 Assistants	19,753 92	
Assistant, Elementary, assigned	1,696 27	
Assignments of Teachers, Day Schools, to Instrumental Instruction	675 00	
		40,099 19

Speech Improvement Classes.

Teachers	$19,804 85	
2 additional teachers, from September	1,700 00	
		21,504 85

Continuation School.

Principal and teachers	$126,339 91	
1 Trade Assistant, from September	318 00	
Temporary teachers and toolkeepers now in service	9,884 00	
Promotion, from shop instructor to shop foreman	48 00	
Promotion, from instructor to instructor boys' classes	48 00	
		$136,637 91

Department of Evening Schools.

Director	$4,260 00	
Supervisor of Division C classes	337 50	
		4,597 50

Evening High Schools.

Principals, teachers and clerical assistants, existing schools	47,817 75

Evening Elementary Schools.

Principals, teachers and clerical assistants	66,792 75

Evening School Extension.

Principal, teachers and clerical assistants	4,500 00

Day Practical Arts Classes.

Teachers, afternoon classes	$2,330 00	
Teachers, summer classes (canning)	440 00	
		2,770 00

Boston Trade School, Evening Classes.

Teachers and clerks	10,000 00

Day School for Immigrants.

Teachers	$6,179 73	
Special Assistants	13,175 00	
20 attendants	600 00	
		19,954 73

Summer Review Schools.

High Review School.

Principals and teachers	5,380 00

Elementary Review Schools.

Principals and teachers	19,700 00

Department of Practice and Training.

First Assistant Director	$3,060 00	
3 Assistant Directors	7,713 67	
2 Primary Supervisors	5,200 00	
Assistant, elementary, assigned	2,292 00	
		18,265 67

Director of Kindergartens.

Director	$3,396 00	
Assistant Director	2,292 00	
		$5,688 00

Director of Special Classes.

Director		3,036 00

Department of Salesmanship.

Director	—	
Junior Master assigned as Commercial Co-ordinator	$3,237 60	
		3,237 60

Director of Penmanship.

Director	$2,796 00	
Assistant, elementary, assigned	2,191 92	
		4,987 92

Vocational Guidance.

Director	$3,036 00	
6 Vocational Assistants	13,696 53	
1 Senior Instructor, assigned	2,905 60	
2 Temporary Vocational Assistants	2,184 00	
		21,822 13

Chief Examiner.

Chief Examiner	4,284 00

Department of Educational Investigation and Measurement.

Assistant Director of Educational Investigation and Measurement	$3,276 00	
Salary of Research Assistant	2,094 67	
Study of intermediate program	—	
Supervision of testing summer work	—	
Correction and tabulation, intelligence tests,	—	
		5,370 67
Salary adjustments		2,000 00
Total, salaries of instructors		$8,319,366 97

SALARIES OF OFFICERS.

Officers, Clerks, Assistants and Stenographers.

Superintendent	$10,000 00
Assistants (31, including one part time) to the Superintendent	39,884 00
Assistant Superintendents (5)	30,000 00
Secretary	5,496 00
Assistant Secretary	3,000 00
Assistants (8) and messenger (1) to the Secretary	12,844 00
Business Agent	6,000 00

Chief Accountant (1), assistants (24) and chauffeurs (2) to the Business Agent	$43,184 00	
Schoolhouse Custodian	3,500 00	
Clerk to Schoolhouse Custodian	1,456 00	
City Treasurer, Custodian of the Retirement Fund	1,500 00	
Telephone operator	1,092 00	
Substitute telephone operator	299 00	
Allowance for temporary assistance and increases:		
Superintendent, temporary assistance	2,000 00	
Superintendent, salary adjustments	1,787 00	
Secretary, temporary assistance	100 00	
Secretary, salary adjustments	52 00	
Business Agent, temporary assistance	2,500 00	
Business Agent, salary adjustments	722 00	
Schoolhouse Custodian, temporary assistance	75 00	
Schoolhouse Custodian, salary adjustments,	104 00	
Additional assistance:		
2 additional assistants and 1 additional storekeeper, to Business Agent, from February 1	3,333 14	
Officers, clerks, assistants and stenographers		168,928 14
Attendance Officers.		
1 Chief Attendance Officer	$3,500 00	
28 Attendance Officers	59,748 30	
		63,248 30
Supervisor of Licensed Minors.		
Supervisor		2,436 00
Newsboys' Trial Board.		
Salaries, judges	$78 00	
Salary, clerk	26 00	
		104 00
Total, salaries of officers		$234,716 44

SALARIES OF CUSTODIANS.

Normal Group:		
Custodian	$10,506 79	
Matron	860 36	
		$11,367 15
Latin and High Schools:		
English High and Public Latin		8,021 14
Brighton High		4,006 14
Charlestown High:		
Custodian	$3,877 34	
Matron, from September	347 00	
		4,224 34

Dorchester High:			
Custodian	$7,780 64		
Additional compensation	600 00		
Matrons (2)	1,720 71		
3 Portables	397 33		
		$10,498 68	
East Boston High		3,871 09	
Girls' High:			
Custodian	$6,463 63		
Matron	860 36		
		7,323 99	
High School of Commerce		6,525 68	
High School of Practical Arts:			
Custodian	$6,031 36		
Matron	860 36		
		6,891 72	
Hyde Park High		3,749 07	
Mechanic Arts High		9,172 97	
Roxbury High:			
Custodian	$5,235 14		
Matron	860 36		
		6,095 50	
South Boston High:			
Custodian	$5,233 58		
Matron	860 36		
		6,093 94	
West Roxbury High:			
Custodian	$4,394 60		
Matron	860 36		
3 Portables	441 13		
Additional compensation	132 44		
		5,828 53	
Normal, Latin and High Schools			$93,669 94
Normal, Latin and High Schools, as above			$93,669 94
247 Elementary School Buildings:			
Custodians		$402,003 70	
Matrons (4)		3,441 43	
194 Portables		25,956 71	
			431,401 84
Hired Accommodations:			
Barnard Memorial		$300 00	
Lincoln House		100 00	
			400 00
Special Schools:			
Horace Mann School:			
Custodian		$1,469 39	
Matron (including additional compensation)		1,133 36	
			2,602 75

Trade School for Girls		$3,052 44
Boston Trade School:		
Custodian	$6,862 52	
1 Portable	132 44	
		6,994 96
Continuation School:		
25 La Grange Street	$1,672 22	
Brimmer Building	2,324 53	
278B Tremont street	244 03	
2 Portables	353 53	
		4,594 31
Boston Disciplinary Day School		—
Evening schools, existing schools		18,600 00
Summer Review schools		2,000 00
Supply room, Dartmouth street		661 17
218 Tremont street (employment certificates, etc.)		1,089 26
Gardening, canning, and handicraft classes		852 00
Additional compensation for kindergarten sweeping		1,000 00
Day School for Immigrants		800 00
Mason Street Building		1,538 22
Order of Court (compensation to Mrs. Agnes C. White, 334th to 385th week, inclusive)		521 43
Custodians on leave of absence		1,800 00
Temporary assistance		—
Custodian service, new buildings to be completed during the year		9,200 00
Custodian service, New Administration Building		5,000 00
Vocational meetings and promotional courses, etc.		500 00
Exhibits and educational meetings		500 00
Total, salaries of custodians		$586,778 32

FUEL AND LIGHT.

Bituminous coal:		
7,000 tons delivered to school buildings up to June 15, 1922, under existing contracts, at average price, $9.356 per ton	$65,492 00	
Estimated cost of storage of existing reserve supply	300 00	
Estimated cost of delivery of existing reserve supply	5,550 00	
16,000 tons delivered in school buildings, from June 16, 1922, to January 31, 1923, at $7.50 per ton	120,000 00	
3,000 tons to be purchased and put into storage for reserve supply, at $6 per ton,	18,000 00	
Estimated cost of storage on same, from September 1, 1922	1,200 00	
Bituminous coal for new buildings to be completed during the year	10,800 00	

Bituminous coal, new Administration Building	$1,000 00	
Total for bituminous coal		$222,342 00
Anthracite coal:		
4,500 tons to June 15, 1922, under existing contract, at $14.15 per ton	$63,675 00	
5,500 tons from June 16, 1922, to January 31, 1923, at $12.50 per ton	68,750 00	
Anthracite coal for new buildings to be completed during the year	2,080 00	
Total for anthracite coal		134,505 00
500 cords of wood at $16.70 per cord, average price, including sawing, splitting and housing		8,350 00
Cost of expert services		2,500 00
Cost of moving coal and wood		3,500 00
Wood for new buildings to be completed during the year		114 00
Total for fuel		$371,311 00
Gas	$13,000 00	
Electric current for light	75,000 00	
Mazda lamps	650 00	
Light for new buildings to be completed during the year	1,425 00	
Light for new Administration Building	1,250 00	
Total for light		91,325 00
Electric current for power	$11,000 00	
Power for new buildings to be completed during the year	1,500 00	
Power for new Administration Building	900 00	
Total for power		13,400 00
Heat, light and power, Training School of Mechanic Arts		1,000 00
		$477,036 00
Credit: Amount charged to Extended Use of the Public Schools, for fuel and light		10,500 00
Total, fuel and light		$466,536 00

SUPPLIES AND INCIDENTALS.

Normal School.

302 pupils at $10	$3,020 00	
50 fourth-year pupils, from September, at $10	500 00	
Drawing supplies	200 00	
Manual training supplies	75 00	
Additional allowance, 1922, for music books	200 00	
Total for Normal School		$3,995 00
(Total allowance per pupil, $11.35.)		

Latin and High Schools.

20,034 pupils, as per schedule following, from $5.32 per pupil to $4.07 per pupil (average $4.94)		$99,085 13	
Mechanic Arts High, additional allowance		5,000 00	
Public Latin, additional allowance, 1922		500 00	
English High, additional allowance, 1922		500 00	
Manual training supplies (except Mechanic Arts High)		8,000 00	
Drawing supplies, art books, models, etc.		4,000 00	
Penmanship supplies and special materials		150 00	
Commercial machines and rental of typewriters		5,000 00	
Repairs to typewriters		900 00	
Total for Latin and high schools (Total allowance per pupil, $6.15.)			$123,135 13

Elementary Schools.

Grades, 90,182 pupils, as per schedule following, from $2.10 to $1.60 per pupil (average $1.99)		$180,234 10	
Kindergartens, 8,287 pupils (average $0.85)		7,053 95	
Allowance for ninth grade classes, 1,650 pupils at $5		8,250 00	
Wendell Phillips: special class supplies		150 00	
Dwight: special class supplies		700 00	
Dwight: hospital class supplies		100 00	
Sherwin: special class supplies		350 00	
Additional allowances, 1922, as follows:			
Bennett, ninth grade		400 00	
Edmund P. Tileston		200 00	
Elihu Greenwood		200 00	
Longfellow		200 00	
Martin (Model School)		300 00	
Norcross, ninth grade		200 00	
Robert G. Shaw		200 00	
Roger Wolcott		1,500 00	
Samuel Adams		600 00	
Shurtleff		50 00	
Regular manual training supplies and equipment	$26,425 00		
Additional manual training supplies and equipment, 1922,	4,000 00		
		30,425 00	
Manual training supplies and equipment, gardening		3,000 00	
Manual training supplies and equipment, special classes		2,000 00	
Drawing supplies and equipment for the grades, including vases, models, plants, charts and illustrative materials		27,400 00	

Drawing supplies and equipment, special classes		$600 00	
Regular cookery supplies and equipment	$13,000 00		
Additional cookery supplies and equipment, 1922	1,000 00		
		14,000 00	
Cookery supplies and equipment, special classes		650 00	
Sewing supplies for pupils unable to purchase them		250 00	
Supplies for special classes		300 00	
Penmanship supplies and special materials		500 00	
Recreational handicraft supplies		500 00	
Total for elementary schools (Total allowance per pupil, $2.85.)			$280,313 05

Boston Clerical School.

239 pupils at $7	$1,673 00	
Repairs to typewriters	150 00	
		1,823 00

Horace Mann School.

160 pupils at $4 (exclusive of traveling expenses)	640 00

Trade School for Girls. (Day and Extension Classes.)

Books, supplies and equipment, printing and postage, etc.	8,200 00

Boston Trade School.

Books, supplies and equipment, printing and postage, etc.	17,500 00

Boston Disciplinary Day School.

42 pupils at $5	210 00

Continuation School.

Books, supplies, printing and postage	$8,500 00	
Repairs to typewriters	150 00	
		8,650 00

Evening Schools.

Supplies	8,500 00

Afternoon Practical Arts Classes.

Supplies, etc.	250 00

Summer Practical Arts Classes.

Supplies, etc.	100 00

Day School for Immigrants.

Supplies, etc.	1,750 00

Summer Review Schools.

Supplies for High Review School	$350 00	
Supplies for Elementary Review Schools	650 00	
Reimbursement to day schools for use of books and materials	400 00	
		$1,400 00

Classes for Conservation of Eyesight.

Books, apparatus and supplies	1,100 00

Speech Improvement Classes.

Books and supplies	1,060 00

Music Appropriation.

12 Pianos, kindergarten	$3,900 00	
Pianos, halls	—	
Pianos, rooms	—	
2 Pianos, speech improvement classes	650 00	
1 Piano, special class	325 00	
Repairs, regulation and reconstruction of pianos	3,000 00	
Piano covers, stools and stands	400 00	
Piano tuning and minor repairs	2,500 00	
Moving pianos	350 00	
Orchestral instruments	3,000 00	
Orchestral music	300 00	
Metronomes	—	
		14,425 00

Printing, etc.

Printing and stock for same	$32,500 00	
Advertising	500 00	
Records, proceedings, newspapers, etc.	2,400 00	
		35,400 00

Custodians' Supplies.

Custodians' supplies	32,700 00

School Committee.

Stationery and office supplies, printing and postage	100 00

Superintendent.

Stationery and office supplies, printing and postage	$1,400 00	
3 typewriters	240 00	
		1,640 00

Board of Superintendents.

Stationery and office supplies, printing and postage	900 00

Secretary.

Stationery and office supplies, printing and postage	$1,100 00	
1 typewriter	70 00	
		1,170 00

Business Agent. (Including Supply Room.)

Stationery, account books, office supplies, printing and postage		$2,500 00

Schoolhouse Custodian.

Stationery and office supplies, printing and postage	$350 00	
Automobile	1,200 00	
		1,550 00

Attendance Officers.

Stationery and office supplies, printing and postage		475 00

Supervisor of Licensed Minors.

Stationery and office supplies, printing and postage		75 00

Department of Manual Arts.

Books, pedagogical material, printing, postage and office supplies		1,200 00

Department of Practice and Training.

Books, pedagogical material, printing and office supplies		175 00

Department of Educational Investigation and Measurement.

Special printing and supplies for such investigations as may be approved by the School Committee during the year	—	
Supplies for testing	$2,800 00	
Printing in connection with testing	400 00	
Supplies for examiner in penmanship	100 00	
Office supplies and incidentals	300 00	
		3,600 00

Director of Household Science and Arts.

Books, pedagogical material, printing and office supplies		150 00

Director of Kindergartens.

Books, pedagogical material, printing and office supplies		150 00

Director of Special Classes.

Books, pedagogical material, printing and office supplies		175 00

Commercial Co-ordinator.

Books, pedagogical material, printing, office supplies, etc.		400 00

Director of Penmanship.

Books, pedagogical material, printing, office supplies, etc.		260 00

Director of Music.

Books, pedagogical material, printing and office supplies	$300 00	
Examiners of pupils, expenses	350 00	
		650 00

Director of Evening Schools.

Books, postage, printing and office supplies		$400 00

Vocational Guidance.

Supplies, printing, postage, etc.		425 00

Advisory Committee on Music.

Material, copying of music, postage, etc.		—

Express Charges.

Express charges		2,000 00

Transportation.

(*a*)	Railroad and other fares (except street car tickets), Horace Mann School pupils	$1,800 00	
(*b*)	Car tickets as authorized by the Board	12,880 00	
(*c*)	Automobile hire for emergency use	250 00	
(*d*)	Automobile mileage of officers of the Board and of such teachers and members of the supervising staff as may be designated by the Superintendent at rates to be fixed by the Business Agent,	1,000 00	
			15,930 00

Tuition.

(*a*)	Wards of the city	$12,300 00	
(*b*)	Others (pupils attending school in the town of Brookline and in outside industrial and agricultural schools, etc.)	9,830 00	
			22,130 00

Miscellaneous.

(*a*)	Diplomas	$3,000 00	
(*b*)	Removing ashes and snow	2,300 00	
(*c*)	Surety bonds	75 00	
(*d*)	School Committee Contingent Fund	1,800 00	
(*e*)	Board of Superintendents' Contingent Fund, educational magazines, books, lectures, etc	500 00	
(*f*)	Assistance, teachers' examinations	2,000 00	
(*g*)	School exhibits $500 00 Special class exhibits, 1922 500 00	1,000 00	
(*h*)	Telephone and telegraph (exclusive of schools)	5,550 00	
(*i*)	Bath expenses, soap and towels for use in kindergartens, prevocational classes, etc.	2,610 00	
(*j*)	Badges, licensed minors	170 00	

(*k*) Improvement and promotional courses for teachers	$5,250 00	
(*l*) Services of certified public accountants, auditing accounts	1,100 00	
(*m*) Services of experts to the Business Agent,	1,200 00	
(*n*) Traveling expenses of officers, teachers, and members of the supervising staff	1,000 00	
(*o*) Automobile supplies, equipment, repairs, etc.	1,800 00	
(*p*) Printing for publicity	1,000 00	
(*q*) Sundries	1,600 00	
(*r*) Unassigned for special needs	20,000 00	
		$51,955 00
Total, supplies and incidentals		$649,161 18

SCHEDULE FOR SUPPLIES AND INCIDENTALS FOR LATIN AND HIGH SCHOOLS 1922–23.

Each school shall be allowed $5.32 for each pupil up to 400; for all pupils in excess of 400 each school is to be allowed $5.07 per pupil up to 800; for all pupils in excess of 800 each school is to be allowed $4.82 per pupil up to 1,200; for all pupils in excess of 1,200 each school is to be allowed $4.57 per pupil up to 1,600; for all pupils in excess of 1,600 each school is to be allowed $4.32 per pupil up to 2,000; and for all pupils in excess of 2,000 each school is to be allowed $4.07 per pupil.

It should be understood that the allowance per pupil is the same in all schools up to the limit of the number of pupils.

Number of Pupils.	Allowance per Pupil.	Total.
Up to 400	$5 32	$2,128
401 to 800	5 07	4,156
801 to 1,200	4 82	6,084
1,201 to 1,600	4 57	7,912
1,601 to 2,000	4 32	9,640
2,001 and upwards	4 07	—

SCHEDULE FOR SUPPLIES AND INCIDENTALS FOR ELEMENTARY SCHOOLS — GRADES, 1922–23.

Each school shall be allowed $2.10 per pupil up to 600: For all pupils in excess of 600 each school is to be allowed $2 per pupil up to 1,000; for all pupils in excess of 1,000 each school is to be allowed $1.90 per pupil up to 1,400; for all pupils in excess of 1,400 each school is to be allowed $1.80 per pupil up to 1,800; for all pupils in excess of 1,800 each school is to be allowed $1.70 per pupil up to 2,200; for all pupils in excess of 2,200 each school is to be allowed $1.60 per pupil.

It should be understood that the allowance per pupil is the same in all schools up to the limit of the number of pupils.

Number of Pupils.	Allowance per Pupil.	Total.
Up to 600	$2 10	$1,260
601 to 1,000	2 00	2,060
1,001 to 1,400	1 90	2,820
1,401 to 1,800	1 80	3,540
1,801 to 2,200	1 70	4,220
2,201 and upwards	1 60	—

Physical Education.

Salaries.

Director of Physical Training	$3,996 00	
Clerk	1,144 00	
Clerk, part time	520 00	
Temporary clerical assistance	—	
4 Instructors in Military Drill	10,176 00	
Armorer	1,896 00	
14 Instructors, Physical Training	32,334 27	
10 Assistant Instructors, Physical Training	19,191 36	
13 Teacher Coaches	9,668 00	
12 Teacher Managers	1,800 00	
Employment of Play Teachers, high schools, 421 days at $2.25 per day	947 25	
2 Temporary Instructors of Drum and Bugle Corps, signaling and armorer, Latin and day high schools at $8 per day (181 days),	2,896 00	
1 Temporary Instructor of Military Drill at $8 per day (112 days)	896 00	
1 Assistant Instructor, Physical Training (vacancy)	1,668 00	
		$87,132 88

Supplies and Equipment.

Office supplies, postage, printing and incidentals	$1,150 00	
Supplies, equipment and incidentals, high school athletics	6,500 00	
Military supplies and annual parade	10,000 00	
Exhibition drills	500 00	
Rifle practice for high school pupils	760 00	
Supplies for gymnastics, games and play; new apparatus and equipment and repairs on same	5,500 00	
		24,410 00

PLAYGROUNDS.

Salaries.

Supervisor of Playgrounds	$2,073 12	
Salaries of Playground Supervisors and Teachers, existing basis	46,000 00	
Salaries of Custodians	5,500 00	
		$53,573 12

Supplies and Equipment.

New apparatus, repairs on apparatus and supplies for games and play	9,196 72
Totals, physical education	$174,312 72

Amount available:

From the tax levy — 11 cents	$171,312 72	
Estimated income	3,000 00	
		$174,312 72

SCHOOL PHYSICIANS AND NURSES.

MEDICAL INSPECTION.

Salaries.

Director	$3,516 00	
Medical Inspector	2,328 00	
48 School Physicians	43,200 00	
1 School Physician	1,296 00	
Temporary School Physicians	1,500 00	
Clerk	1,456 00	
Temporary clerical assistance	100 00	
		$53,396 00

Supplies and Incidentals.

Special outfits, charts and apparatus	$1,735 36	
Printing, postage, office supplies and incidentals	1,000 00	
Medical supplies and incidentals	650 00	
		3,385 36

NURSES.

Salaries.

1 Supervising Nurse	$2,196 00	
51 School Nurses	78,837 60	
		81,033 60

Supplies and Incidentals.

Supplies	$1,000 00	
Car tickets	1,050 00	
Postage, printing, office supplies and incidentals	300 00	
		2,350 00
Total, school physicians and nurses		$140,164 96

PENSIONS TO TEACHERS.

For pensions to retired teachers and payments to the Trustees of the Permanent Pension Fund, the amount available under chapter 589 of the Acts of 1908, chapter 617 of the Acts of 1910, chapter 304 of the Acts of 1915, and chapter 206 of the Special Acts of 1919, viz., 7 cents on each $1,000 of the valuation of the city	$109,017 18

PENSION TO ATTENDANCE OFFICERS AND CUSTODIANS.

Pensions to 1 retired attendance officer and 12 retired custodians	$6,956 64

EXTENDED USE OF THE PUBLIC SCHOOLS.

Salaries, Administration.

Director	$3,396 00	
Clerk	1,196 00	
		$4,592 00

Supplies and Incidentals, Administration.

Office supplies	$250 00	
Advertising, printing, tickets, etc.	200 00	
New office equipment	100 00	
		550 00

Salaries, Centers and Other Activities.

Managers	$10,000 00	
Associate managers	6,600 00	
Leaders, helpers, matrons	7,430 67	
Lectures, concerts, entertainments, patriotic meetings, etc.	2,000 00	
		26,030 67

Custodians' Salaries, Centers and Other Activities.

Centers	$5,648 98	
Schoolhouse accommodations	3,000 00	
Lectures, concerts, entertainments, patriotic meetings, etc.	500 00	
		9,148 98

Supplies and Equipment, Centers and Other Activities.

Supplies	$1,200 00	
Equipment	1,700 00	
Supplies and incidentals for lectures, concerts, entertainments, patriotic meetings, etc.	500 00	
Estimated cost of fuel and light	10,500 00	
		13,900 00
Total, extended use of the public schools		$54,221 65

Amount available:		
From the tax levy, 3 cents	$46,721 65	
Estimated income	7,500 00	
		$54,221 65

ALTERATION AND REPAIR OF SCHOOL BUILDINGS.

(To be expended by the Schoolhouse Department.)

Total amount available for the alteration and repair of school buildings, and for furniture, fixtures and means of escape in case of fire, and for fire protection for existing buildings, and for improving existing school yards (84 cents per $1,000 average valuation)	$1,308,206 26

Ordered, That to meet the current expenses of the School Committee during the financial year February 1, 1922, to January 31, 1923, the following sums are hereby appropriated for the purposes stated:

For general school purposes, including Americanization and Vocational Guidance:	
Salaries of instructors	$8,319,366 97
Salaries of officers	234,716 44
Salaries of custodians	586,778 32
Fuel and light	466,536 00
Supplies and incidentals	649,161 18
Pensions to attendance officers and custodians	6,956 64
Physical education	174,312 72
School physicians and nurses	140,164 96
Pensions to teachers	109,017 18
Extended use of the public schools	54,221 65
Total	$10,741,232 06

The foregoing order appropriating the sum of $10,741,232.06 was passed by the School Committee on April 24, 1922, and was approved by his Honor the Mayor on May 2, 1922.

On April 24, 1922 the School Committee passed the following order which was approved by his Honor the Mayor on May 2, 1922.

Ordered, That to provide funds for the alteration and repair of school buildings for furniture, fixtures and means of escape in case of fire, and for fire protection for existing buildings, and for improving existing school yards during the financial year February 1, 1922, to January 31, 1923, the following sums are hereby appropriated:

(*a.*)	Repairs, English High School	$50,000 00
(*b.*)	Machinery, East Boston High School	10,000 00
(*c.*)	Gunracks	10,000 00
(*d.*)	Boston Trade School, linotype repairs	700 00
(*e.*)	Approved productive work by pupils	15,000 00
(*f.*)	Unassigned	914,300 00
	Total	$1,000,000 00

On May 1, 1922 the School Committee passed the following order which was approved by his Honor the Mayor on May 5, 1922.

Ordered, That to provide funds for the alteration and repair of school buildings for furniture, fixtures and means of escape in case of fire, and for fire protection for existing buildings and for improving existing school yards, during the financial year February 1, 1922, to January 31, 1923, the sum of one hundred thousand dollars ($100,000) is hereby appropriated in addition to the amount appropriated in Item f (unassigned) at the meeting of April 24, 1922.

NEW SCHOOL BUILDINGS, LANDS, YARDS, ETC.

On April 17, 1922 the School Committee passed the following order which was approved by his Honor the Mayor on April 21, 1922.

Ordered, That in accordance with the provisions of chapter 206 of the Special Acts of 1919, as amended by chapter 524 of the Acts of 1920, the following appropriations are hereby made for the purpose of meeting the administration expenses of the Schoolhouse Department for the additional cost of accomodations previously authorized and for the rent of hired school accommodations:

ADMINISTRATION EXPENSES, SCHOOLHOUSE COMMISSION.

Item 1.— Administration expenses, Schoolhouse Department,	$45,000 00

ADDITIONAL PROVISION TO MEET COST OF ACCOMMODATIONS PREVIOUSLY AUTHORIZED.

Item 2.— Charles Sumner District, West Roxbury: Completion of intermediate school (Item 20, 1920; Item 13, 1921)	$67,000 00
Item 3.— Henry L. Pierce District, Dorchester: Completion of four-room building to connect with Bailey Street Building (Item 14, 1921)	8,000 00
Item 4.— Julia Ward Howe District, Roxbury: Completion of addition on Julia Ward Howe lot, four rooms and hall (Item 35, 1920; Item 21, 1921)	17,000 00
Item 5.— Robert G. Shaw District, West Roxbury: Completion of four-room building, Grades I. to VI., near Washington street and High View avenue (Item 22, 1921) .	8,000 00
Item 6.— Dearborn District, Roxbury, High School of Practical Arts: Completion of addition (Item 4, 1916),	378 20
Item 7.— Edmund P. Tileston District, Dorchester: Completion of four-room building, Grades I. to III. and kindergarten (Item 31, 1920; Item 15, 1921) . . .	8,000 00

HIRED ACCOMMODATIONS.

Item 8.— Rent of hired accommodations	60,000 00
Total	$213,378 20

On May 8, 1922, the School Committee passed the following order which was approved by his Honor the Mayor on May 17, 1922.

Ordered, That in accordance with the provisions of Chapter 206 of the

Special Acts of 1919, as amended by Chapter 524 of the Acts of 1920, the following appropriations are hereby made for the purpose of meeting the additional cost of accommodations previously authorized, and for additional permanent and portable school accommodations by items as follows:

ADDITIONAL PROVISION TO MEET COST OF ACCOMMODATIONS PREVIOUSLY AUTHORIZED.

Item 9.— Mather District, Dorchester: Land and construction of twenty-class-room intermediate school building (Item 36, 1920) $436,000 00

ADDITIONAL SCHOOL ACCOMMODATIONS.

Item 10.— Phillips Brooks District, Dorchester: Construction of intermediate school building, twenty class rooms, hall and shops (Item 32, 1920) $147,831 14

Item 11.— Lewis District, Roxbury: Roxbury High and Boston Clerical Schools — Construction of eighteen-room annex without laboratories, with lunchroom and gymnasium (Item 25, 1920) 372,800 00

Item 12.— William E. Endicott District, Dorchester: Additional land and construction of sixteen-room unit of intermediate school building, without hall or special rooms 316,340 00

Item 13.— Thomas Gardner District, Brighton: Disposal of annex, and construction of eight-room addition — Grades I. to VI. and kindergarten 160,000 00

Item 14.— Bennett District, Brighton: Land and construction of eight-room unit of sixteen-room school building — Grades I. to VI. and kindergarten 172,000 00

Item 15.— Bennett District, Brighton: Land and construction of four-room unit of sixteen-room building — Grades I. to III. and kindergarten 102,000 00

Item 16.— Emerson District, East Boston: Land and construction of intermediate school building, twenty class rooms 486,000 00

Item 17.— Martin District, Roxbury: Land and construction of sixteen or eighteen-room unit of a new central girls' high school, without laboratories, with gymnasium and lunchroom 135,000 00

Item 18.— Samuel Adams District, East Boston: Land and construction of intermediate school building, twenty class rooms and shops 49,000 00

Item 19.— Francis Parkman District, Jamaica Plain: Land and construction of four-room unit of eight-room building — Grades I. to III. and kindergarten . . 18,200 00

Item 20.— Hugh O'Brien District, Roxbury: Land and construction of eight-room unit of twelve-room annex — Grades I. to VI., kindergarten, cookery and manual training rooms 26,800 00

Item 21.— Bennett District, Brighton: Construction of additional story on Winship School building, and remodelling of present building for intermediate school purposes, with additional shops $10,000 00

Additional Portable Buildings.

Item 22.— Twelve additional portable buildings . . . $42,000 00

Total $2,473,971 14

In addition to the foregoing orders making appropriations for new school buildings, lands, yards, etc., from the tax levy, the following order making appropriations for the same purposes by transfer from unexpended balances was passed by the School Committee on May 8, 1922, and was approved by his Honor the Mayor on May 17, 1922.

Transfer of Appropriations.

Ordered, That of the sums appropriated by the School Committee on March 8, 1917 (pages 41–43), June 3, 1918 (pages 79–80), June 16, 1919 (page 89), September 8, 1919 (pages 137–138), June 21, 1920 (pages 104–105), May 16, 1921 (pages 60–61), respectively, the following sums are hereby transferred from the 1917, 1918, 1919, 1920, and 1921 items indicated to the 1922 item of permanent school accommodations, as set forth below:

From Item 6, 1917.— Roger Wolcott District, Dorchester: Elementary school, upper grades, completion of building at the corner of Norfolk and Morton streets . . $2,144 93

From Item 4, 1918.— Henry L. Pierce District, Dorchester: Elementary school, upper grades, completion of building on Dunbar avenue, near Moody street (Item 3, 1917), 491 28

From Item 9, 1918.— Agassiz-Bodwitch Districts, Jamaica Plain: West Roxbury High School, ten-room addition, 32 37

From Item 11, 1918.— Bennett District, Brighton: Land and plans for six-room building, upper grades, in vicinity of Mary Lyon School 3,000 00

From Item 2, 1919.— Henry Grew District, Hyde Park: Hyde Park High School, completion of addition authorized in 1915 (Item 5, 1916; Item 5, 1917) . . . 167 21

From Item 3, 1919.— Oliver Wendell Holmes District, Dorchester: Elementary school, upper and lower grades, completion of enlargement of building on Glenway and Harvard streets (Item 10, 1915; Item 8, 1916; Item 8, 1917) 481 57

From Item 5, 1919.— Eliot-Hancock District, North End: Charter street, elementary school, completion of Michael Angelo School, first unit (Item 3, 1914, Bond Issue; Item 9, 1915; Item 8, 1916; Item 15, 1917; Item 5, 1918) 102 84

From Item 8, 1919.— Roger Wolcott District, Dorchester: Intermediate school, plans and twenty-room building with four shops 41,875 00

From Item 13, 1919.— Twenty-one additional portable schoolhouses	$653 78
From Item 14, 1919.— Roger Wolcott District, Dorchester: Completion of second unit, Pauline Agassiz Shaw School,	1,438 92
From Item 11, 1920.— Samuel Adams District, East Boston: Completion of elementary school (Item 9, 1919)	90,000 00
From Item 12, 1920.— Eliot–Hancock District, North End: Charter Street Elementary School, completion of Michael Angelo School, second unit (Item 3, 1920)	13,000 00
From Item 13, 1920.— Lewis District, Roxbury: Completion of Lewis Elementary School (Item 5, 1920)	10,500 00
From Item 16, 1920.— Additional portable schoolhouses	931 80
From Item 21, 1920.— Emerson District, East Boston: Plans for extension to Emerson building: six intermediate class rooms, four rooms for manual training and domestic science, and one principal's office	16,000 00
From Item 27, 1920.— Edward Everett District, Dorchester: Grading of addition to school yard	602 00
From Item 2, 1921.— Bowdoin District, West End: Grading of extension of yard of Bowdoin School (Item 7, 1920)	2,747 16
From Item 10, 1921.— Emerson District, East Boston: Construction of extension to Emerson building: six intermediate class rooms, four rooms for manual training and domestic science, and one principal's office (Item 21, 1920)	118,000 00
To Item 10 in the schedule of additional permanent school accommodations for which appropriation has been made on this date.— Phillips Brooks District, Dorchester: Construction of intermediate school building, twenty class rooms, hall and shop (Item 32, 1920)	302,168 86
Total	$604,337 72

SUMMARY.

Current expenses	$10,741,232 06
Alteration and repair of school buildings	1,100,000 00
New school buildings, lands, yards, etc. (from the tax levy),	2,687,349 34
New school buildings, lands, yards, etc., by transfer of unexpended balances	604,337 72
Total	$15,131,919 12

On May 15 at the time this report went to press there remained unappropriated of the amount available for land and buildings and repairs and alterations, the sum of $59,400.03. This sum may be appropriated at any date up to the time the Board of Assessors close their books for the purpose of establishing the tax rate for the year.

SHEET NO. 1.

TOTAL AND PER CAPITA COSTS

OF SCHOOLS AND ALL OTHER ACTIVITIES WITH DIRECT INCOME DEDUCTED; WITH COSTS OF ADMINISTRATION, SUPERVISION AND GENERAL CHARGES ADDED; WITH RECEIPTS FROM TUITION CHARGES DEDUCTED; AND WITH APPORTIONED INCOME DEDUCTED.

TOTAL AND PER CAPITA COSTS OF SCHOOLS AND ALL OTHER ACTIVITIES WITH DIRECT INCOME DEDUCTED.*

WITH COSTS OF ADMINISTRATION, SUPERVISION AND GENERAL CHARGES ADDED; WITH RECEIPTS FROM TUITION CHARGES DEDUCTED; AND WITH APPORTIONED INCOME DEDUCTED.

	Normal School.	Latin and High Schools.	Elementary Schools.	Speech Improvement Classes.	Boston Clerical School.	Boston Disciplinary Day School.	Horace Mann School.	Trade School for Girls.*	Boston Trade School, Day Classes.	Summer Rehabilitation Classes.	Continuation School, Compulsory.	Day School for Immigrants.	Recreational Handicraft Classes.	Training School for Teachers of Mechanic Arts.	Summer Review High School.	Summer Review Elementary Schools.	Evening High Schools.	Evening Elementary Schools.	Evening School Extension.	Boston Trade School, Evening Classes.	Afternoon Practical Arts Classes.	Park Playgrounds.	Schoolyard Playgrounds.	School Centers.	Use of School Accommodations.	
Cost, with direct income deducted, and exclusive of administration, supervision and general charges.	$62,500 63	$2,006,165 87	$6,644,528 75	$24,629 20	$26,188 72	$7,976 43	$45,549 72	$44,707 56	$67,190 51	$5,395 18	$67,243 03	$7,431 90	$889 95	$1,429 16	$5,647 28	$20,781 55	$58,860 07	$68,916 75	$4,538 68	$8,416 19	$1,021 35	$41,587 46	$18,478 93	$42,106 88	$5,212 85	Cost, with direct income deducted, and exclusive of administration, supervision and general charges.
Average membership	278	17,873	96,615		185	45	153		429																	Average membership.
Cost per pupil, direct charges only (on average membership)	$224 82	$112 25	$68 77		$141 56	$177 25	$297 79		$156 62																	Cost per pupil, direct charges only (on average membership).
Average attendance	270	16,847	89,463		171	34	136		398						529	3,880	2,265	3,505	892	355	316	8,652	5,491	10,566	‡ 265,677	Average attendance.
Cost per pupil, direct charges only (on average attendance)	$231 48	$119 08	$74 27		$153 15	$234 60	$334 92		$168 82						$10 68	$5 36	$25 99	$19 66	$5 09	$23 71	$3 23	$4 81	$3 37	$3 99	$0 019	Cost per pupil, direct charges only (on average attendance).
Number of pupil hours	265,458	16,318,237	77,453,656		167,049	30,335	122,200	424,791	531,032		565,005	111,505			84,640	465,600	320,627	507,794	26,804	54,830	13,822					Number of pupil hours.
Cost per pupil hour	$0 235	$0 122	$0 085		$0 156	$0 262	$0 372	$0 105	$0 126		$0 119	$0 066			$0 066	$0 044	$0 183	$0 135	$0 169	$0 153	$0 073					Cost per pupil hour.
Cost per pupil per session, direct charges only (on average attendance)																						$0 024	$0 037			Cost per pupil per session, direct charges only (on average attendance).
Above cost brought down	$62,500 63	$2,006,165 87	$6,644,528 75	$24,629 20	$26,188 72	$7,976 43	$45,549 72	$44,707 56	$67,190 51	$5,395 18	$67,243 03	$7,431 90	$889 95	$1,429 16	$5,647 28	$20,781 55	$58,860 07	$68,916 75	$4,538 68	$8,416 19	$1,021 35	$41,587 46	$18,478 93	$42,106 88	$5,212 85	Above cost brought down.
Cost of administration, supervision and general charges	2,706 48	93,903 63	391,279 92	1,066 12	799 58	1,856 77	1,066 11	4,057 30	2,800 96		8,715 76	3,010 31			300 83	1,459 48	4,011 99	8,996 10	661 98	528 80	401 50	1,923 75	1,923 74	4,299 69	758 77	Cost of administration, supervision and general charges.
Total	$65,207 11	$2,100,068 90	[1] $7,035,808 67	$25,695 32	$26,988 30	$9,833 20	$46,615 83	$48,764 86	$69,991 47	$5,395 18	$75,958 79	$10,442 21	$889 95	$1,429 16	$5,948 11	$22,241 03	$62,871 16	$77,912 85	$5,200 66	$8,944 99	$1,422 85	$43,511 21	$20,402 67	$46,406 57	$5,971 62	*Total.*
Cost per pupil, total (on average membership)	$234 56	$117 50	[1] $72 45		$145 88	$218 52	$304 68		$163 15																	*Cost per pupil, total (on average membership).*
Cost per pupil, total (on average attendance)	$241 51	$124 66	[1] $78 21		$157 83	289 21	$342 76		$175 86						$11 24	$5 73	$27 76	$22 23	$5 83	$25 20	$4 50	$5 03	$3 72	$4 39	† $0 022	*Cost per pupil, total (on average attendance).*
Cost per pupil hour, total	$0 215	$0 128	[1] $0 090		$0 161	$0 324	$0 381	$0 114	$0 131		$0 134	$0 093			$0 070	$0 047	$0 196	$0 153	$0 194	$0 163	$0 102					*Cost per pupil hour, total.*
Cost per pupil per session, total (on average attendance)																						$0 025	$0 040			*Cost per pupil per session, total (on average attendance).*
Above total brought down	$65,207 11	$2,100,068 90	[1] $7,035,808 67	$25,695 32	$26,988 30	$9,833 20	$46,615 83	$48,764 86	$69,991 47	$5,395 18	$75,958 79	$10,442 21	$889 95	$1,429 16	$5,948 11	$22,241 03	$62,871 16	$77,912 85	$5,200 66	$8,944 99	$1,422 85	$43,511 21	$20,402 67	$46,406 57	$5,971 62	Above total brought down.
Number of non-resident pupils	14	78	86		3				86							1		1		12						Number of non-resident pupils.
Average number of pupil hours, non-resident pupils	12,600	70,200	77,400		2,700				77,400							120		154		1,848						Average number of pupil hours, non-resident pupils.
Deduct tuition received for non-resident pupils	$2,686 00	$11,123 69	$2,815 34	$26 80	$481 00				$16,042 27		$90 00	$11 20		$905 96		$10 00	$17 00	$38 00		$480 07						Deduct tuition received for non-resident pupils.
Number of resident pupils (on average membership)	264	17,795	[1] 97,030		182	45	153		343																	Number of resident pupils (on average membership).
Number of resident pupils (on average attendance)	256	16,769	[1] 89,878		168	34	136		312						529	3,879	2,265	3,504	892	343	316	8,652	5,491	10,566	‡ 265,677	Number of resident pupils (on average attendance).
Number of pupil hours, resident pupils	252,858	16,248,037	[1] 77,827,156		164,349	30,335	122,200	424,791	453,632		565,005	111,505			84,640	465,480	320,627	507,640	26,804	52,982	13,822					Number of pupil hours, resident pupils.
Cost of resident pupils	$63,121 11	$2,088,945 21	$7,032,993 33	$25,668 52	$26,507 30	$9,833 20	[2] $46,615 83	[2] $48,764 86	$53,949 20	$5,395 18	$75,868 79	$10,431 01	$889 95	$523 20	$5,948 11	$22,231 03	$62,854 16	$77,874 85	$5,200 66	$8,464 92	$1,422 85	$43,511 21	$20,402 67	$46,406 57	$5,971 62	Cost of resident pupils.
Cost per resident pupil (on average membership)	$239 10	$117 39	$72 48		$145 64	$218 52	$304 68		$157 29																	Cost per resident pupil (on average membership).
Cost per resident pupil (on average attendance)	$246 57	$124 57	$78 25		$157 78	$289 21	$342 76		$172 91						$11 24	$5 73	$27 75	$22 22	$5 83	$24 68	$4 50	$5 03	$3 72	$4 39	† $0 022	Cost per resident pupil (on average attendance).
Cost per pupil hour, resident pupils	$0 249	$0 128	$0 090		$0 161	$0 324	$0 381	$0 114	$0 118		$0 134	$0 093			$0 070	$0 047	$0 196	$0 153	$0 194	$0 159	$0 102					Cost per pupil hour, resident pupils.
Cost per resident pupil per session (on average attendance)																						$0 025	$0 040			Cost per resident pupil per session (on average attendance).
Cost of resident pupils brought down	$63,121 11	$2,088,945 21	$7,032,993 33	$25,668 52	$26,507 30	$9,833 20	[2] $46,615 83	[2] $48,764 86	$53,949 20	$5,395 18	$75,868 79	$10,431 01	$889 95	$523 20	$5,948 11	$22,231 03	$62,854 16	$77,874 85	$5,200 66	$8,464 92	$1,422 85	$43,511 21	$20,402 67	$46,406 57	$5,971 62	Cost of resident pupils brought down.
Deduct income, apportioned	122 15	4,495 23	17,932 06	97 72	73 29	24 43	44,993 79	6,352 27	195 45		439 75	48 86			24 43	122 15	3,051 02	20,478 85	24 43	24 43						Deduct income, apportioned.
Net cost of resident pupils §	$62,998 96	$2,084,449 98	$7,015,061 27	$25,570 80	$26,434 01	$9,808 77	$1,622 04	$42,412 59	$53,753 75	$5,395 18	$75,429 04	$10,382 15	$889 95	$523 20	$5,923 68	$22,108 88	$59,803 14	$57,396 00	$5,176 23	$8,440 49	$1,422 85	$43,511 21	$20,402 67	$46,406 57	$5,971 62	Net cost of resident pupils.§
Net cost per resident pupil (on average membership) §	$238 63	$117 14	$72 30		$145 24	$217 67	$10 60		$156 72																	Net cost per resident pupil (on average membership).§
Net cost per resident pupil (on average attendance) §	$246 09	$124 30	$78 05		$157 35	$288 49	$11 93		$172 29						$11 20	$5 70	$26 40	$16 38	$5 80	$24 61	$4 50	$5 03	$3 72	$4 39	† $0 022	Net cost per resident pupil (on average attendance).§
Net cost per pupil hour, resident pupils §	$0 249	$0 128	$0 090		$0 160	$0 323	$0 013	$0 069	$0 118		$0 133	$0 093			$0 069	$0 047	$0 186	$0 113	$0 193	$0 159	$0 102					Net cost per pupil hour, resident pupils.§
Net cost per resident pupil per session (on average attendance) §																						$0 025	$0 040			Net cost per resident pupil per session (on average attendance).§

* Including regular summer and extension classes.
† Per capita cost.
‡ Total attendance.
§ That part of the total cost coming from the School Committee's share of the tax levy.

[1] Including the cost of tuition of pupils in the schools of Brookline and Winthrop and of wards of the city placed in other cities and towns; the average number — 501 — and the total pupil hours — 450,900 — of such pupils should be added to the average membership, average attendance and number of pupil hours, making a total of 97,116 pupils on average membership, 89,964 pupils on average attendance and 77,904,556 pupil hours.

[2] Cost of resident and non-resident pupils.

The cost of tuition of pupils, residents of the City of Boston, attending industrial and agricultural schools in other cities and towns, amounting to $331.50, is included under general charges, but the number of such pupils is not included in the average membership or average attendance of any of the above schools.

* EXCLUSIVE OF COSTS OF BUILDING, DEPRECIATION, REPAIRS, INTEREST, AND SINKING FUND CHARGES.

SHEET NO. 2A.

NORMAL SCHOOL. LATIN AND HIGH SCHOOLS.

COST EXCLUSIVE OF ADMINISTRATION, SUPERVISION AND GENERAL CHARGES, AND WITH DIRECT INCOME DEDUCTED.

(For Total and Net Costs, see Sheet No. 1.)

COST OF DAY SCHOOLS, EXCLUSIVE OF ADMINISTRATION, SUPERVISION AND GENERAL CHARGES, AND WITH DIRECT INCOME DEDUCTED.*

NORMAL SCHOOL.*

[For Total and Net Costs, See Sheet No. 1.]

School	Expenses of Instruction.																		Operation of Plant.						Promotion of Health.			Total.	Direct Income.	Net Total.*	Average Membership	Cost per Pupil, Average Membership.*	Average Attendance	Cost per Pupil, Average Attendance.*	Number of Pupil Hours	Cost per Pupil Hour.*	School.
	Salary of Head Master.	Salary of Clerk.	Postage	Telephone	Salaries of Teachers	Salaries of Physical Education Teachers	Text Books.	Supplementary and Reference Books.	Drawing Supplies	Manual Training Supplies.	Commercial Supplies.	Laboratory Supplies.	Music Supplies and Instruments.	Printing.	Miscellaneous Educational Supplies	Physical Education Supplies.	Incidentals.	Total for Instruction.	Number of Pupil Hours.	Cost per Pupil Hour of Instruction.	Salary of Janitor.	Fuel.	Electric Light.	Electric Power	Gas.	Janitors' Supplies.	Total for Operation of Plant.	Salaries, School Physicians	Nurses' Salaries.	Supplies, School Physicians and Nurses	Total for Promotion of Health.								
Normal	$4,698 00	$1,256 10	$25 90	$92 95	$43,418 20	$2,138 02	$292 37	$470 19	$26 24	$276 88	$320 13	$74 88	$896 00	$72 21	$1,436 22	$158 89	$5 38	$55,664 56	265,458	$0 209	$4,143 75	$2,430 62	$483 69	$19 21	$87 23	$140 43	$7,304 93	$294 33	..	$0 93	$295 26	$63,264 75	$761 12	$62,500 63*	278	$224 82*	270	$231 48*	265,458	$0 235*	Normal

[1] Including salary of matron.

LATIN AND HIGH SCHOOLS.*

[For Total and Net Costs, See Sheet No. 1.]

Schools	Expenses of Instruction.																				Operation of Plant						Promotion of Health.			Total.	Direct Income.	Net Total.*	Average Membership	Cost per Pupil, Average Membership.*	Average Attendance	Cost per Pupil, Average Attendance.*	Number of Pupil Hours	Cost per Pupil Hour.*	Schools
	Salaries of Head Masters	Salaries of Clerks	Postage	Telephone	Salaries of Teachers	Salaries of Physical Education Teachers, Including Military Drill	Text Books	Supplementary and Reference Books.	Drawing Supplies and Equipment	Manual Training Supplies and Equipment	Cookery Supplies and Equipment.	Sewing Supplies and Equipment	Commercial Supplies and Equipment	Laboratory Supplies and Equipment	Music Supplies and Instruments.	Printing.	Miscellaneous Educational Supplies	Physical Education Supplies.	Incidentals.	Total for Instruction.	Number of Pupil Hours.	Cost per Pupil Hour of Instruction.	Salaries of Janitors	Fuel.	Electric Light	Electric Power	Gas	Janitors' Supplies	Total for Operation of Plant.	Salaries, School Physicians	Nurses' Salaries.	Supplies, School Physicians and Nurses.	Total for Promotion of Health.								
Public Latin	$4,155 20	$1,272 00	$54 69	$54 11	$100,149 18	$4,418 25	$1,925 15	$235 75	$2 42	.			$193 33	$256 72	$219 78	$165 21	$1,021 16	$2,588 49	$151 63	$118,942 07	1,048,314	$0 113	$3,959 84	$4,552 70	$466 49	$181 10	$509 51	$181 81	$10,191 75	$443 75		$3 35	$447 10	$129,580 92	$259 79	$129,330 13*	1,116	$116 51*	1,068	$121 10*	1,048,314	$0 123*	Public Latin
Girls' Latin	4,098 00	1,272 32	50 92	21 18	62,765 10	3,314 46	2,991 13	208 78[2]		$1 00			344 85	110 21	42 55	51 67	1,502 76	100 83	4 99	77,571 16	783,920	098	[1]4,143 75	2,645 63	737 14	61 43	43 34	140 43	7,772 02	294 33		2 79	297 12	83,640 30	2 75	83,637 55*	836	102 14*	803	100 65*	783,920	109*	Girls' Latin.
Brighton High	4,098 00	1,248 82	33 31	Cr. 42	45,253 68	3,250 70	2,093 41	65 36	385 59	570 83	$95 17		1,129 87	148 29	272 75	36 44	1,024 31	1,195 02	3 15	61,544 28	594,902	103	4,013 71	2,273 98	570 51	310 56	31 25	114 21	7,323 28	356 90		4 37	361 17	69,228 73	293 43	68,930 30*	653	105 56*	610	113 00*	594,902	115*	Brighton High.
Charlestown High	4,074 42	2,240 99	23 14	45 58	49,078 23	3,501 14	2 112 69	61 80	356 85	3,139 67	132 06	$0 30	586 24	215 37	124 00	34 80	845 94	1,886 79	13 84	68,926 94	505,804	136	3,866 72	1,799 93	1,321 06	271 27	77 05	160 32	7,496 35	483 82		2 63	185 85	70,912 11	[2]6,014 86	70,897 24*	558	127 05*	519	136 66*	505,804	140*	Charlestown High.
Dorchester High	4,098 00	2,520 10	51 14	Cr. 4 14	174,400 98	6,759 46	5,996 02	655 97	438 86	2,415 12		143 81	6,718 74	444 01	1,024 70	342 03	2,178 11	2,229 90	37 33	211,370 34	1,656,028	127	[1]10,373 99	7,668 07	3,250 99	197 35	119 70	351 79	21,961 89	591 84		2 79	594 63	233,926 86	[3]1,046 31	232,880 53*	2,166	110 58*	1,939	120 10*	1,656,928	140*	Dorchester High.
East Boston High	4,165 29	1,191 20	14 80	60 17	62,347 38	3,357 22	1,917 03	284 57	443 62	468 19		2 41	4,947 28	285 10	.	81 38	1,597 36	2,032 69	10 12	83,225 62	793,590	104	3,869 48	1,299 78	718 48	146 87	80 49	269 51	6,375 61	358 89		6 63	365 52	89,966 75	254 04	89,712 71*	874	102 65*	816	109 91*	793,590	112*	East Boston High
English High	4,580 00	2,842 84	107 52	105 59	205,443 42	5,358 54	5 878 42	776 77	33 07	1 80			3,000 30	762 14	310 37	157 93	2,366 67	3,058 04	15 12	234,788 74	2,081,047	112	6,761 82	5,529 29	1,974 85	459 34	425 35	275 41	15,426 08	443 75		7 11	450 86	250,665 68	232 54	250,413 14*	2,265	110 56*	2,125	117 84*	2,081,047	120*	English High
Girls' High	4,098 00	2,544 00	90 69	114 14	141,553 57	7,522 04	4,567 42	282 26	245 04	80			2,183 88	339 35	107 00	73 81	2,602 45	221 79	3 02	167,099 24	1,798,784	092	[1]7,303 02	5,190 25	3,068 52	465 62	186 40	476 81	16,691 52	818 00		9 39	827 39	184,618 15	62 90	184,555 25*	2,002	92 19*	1,840	100 30*	1,798,784	102*	Girls' High.
High School of Commerce	4,098 00	2,480 94	84 25	417 29	146,377 39	4,070 16	2,846 37	304 48	54 10			1 92	2,891 76	380 44	030 40	286 10	2,084 56	2,104 29	81 76	170,097 27	1,437,680	118	6,507 80	3,772 60	755 19	324 19	140 33	301 22	11,801 33	294 34		3 70	298 04	182,196 64	257 74	181,938 90*	1,519	119 78*	1,465	124 15*	1,437,680	126*	High School of Commerce
High School of Practical Arts	4,098 00	1,424 12	35 00	38 42	81,697 23	2,220 30	1,137 77	136 48	426 79		172 96	368 37	1,249 33	182 09	.	.	94 77	841 18	170 78	83 99	94,937 10	620,200	153	[1]6,525 89	4,338 25	1,133 77	447 97	373 47	301 32	13,120 67	356 80		3 10	359 90	108,418 06	[4]7,585 35	90,832 68*	685	132 60*	637	142 59*	620,200	146*	High School of Practical Arts
Hyde Park High	4,098 00	1,272 00	32 50	20 28	70,386 88	3,372 86	2,380 30	48 20	366 68	2,961 05	228 64	128 70	2,519 40	237 20	97 75	33 00	633 84	1,248 31	146 60	90,812 19	782,181	116	3,738 80	2,233 87	678 02	379 44	210 52	245 62	7,486 27	346 90		8 23	355 13	98,653 59	[5]7,845 87	90,807 72*	836	108 62*	797	113 94*	782,181	116*	Hyde Park High
Mechanic Arts High	4,098 00	2,534 41	58 34	18 47	170,641 06	950 00	3,060 10	116 16	436 73	2,562 76			262 83	825 72		05 81	3,276 50	385 11	47 93	189,946 13	1,282,928	148	9,147 84	9,350 73	754 24	187 73	101 70	400 80	19,943 04	446 00		1 20	447 20	210,330 37	644 74	209,685 63*	1,290	162 55*	1,238	169 37*	1,282,928	163*	Mechanic Arts High
Roxbury High	4,023 50	990 60	23 90	6 74	80,098 58	4,701 14	3 639 91	222 45	225 37				5,101 30	267 09	48 00	39 60	2,148 02	68 32	5 03	110,109 38	1,257,626	087	[1]6,530 45	3,782 66	1,222 10	73 88	103 22	249 04	11,961 37	486 66		8 56	489 22	122,649 97	79	122,649 18*	1,362	90 05*	1,289	95 15*	1,257,626	097*	Roxbury High.
South Boston High	4,443 29	1 270 41	30 40	11 12	71,743 69	5,027 88	1,716 80	321 33	84 70	3 12			2,025 51	258 10	196 60	41 00	1,204 29	1,378 31	16 48	90,666 94	796,606	113	[1]6,077 24	310 80	779 70	157 59	49 90	236 32	7,611 55	382 28	..	10 64	392 92	98,671 41	251 34	98,420 07*	849	115 92*	814	120 91*	796,606	123*	South Boston High.
West Roxbury High	4,299 00	1 161 59	61 77	Cr. 3 05	72,006 61	4,690 05	2,479 60	227 19	157 33	72 47	.	3 13	3,256 80	500 98	720 30	60 80	794 69	1,074 62	8 86	91,714 04	876,318	104	[1]5,780 88	2 300 17	643 25	249 30	131 73	207 61	9,312 97	197 93	..	2 45	200 38	101,227 39	[4]1,752 61	99,474 78*	928	107 19*	857	112 15*	876,318	113*	West Roxbury High
Totals	$67,705 52	$26,292 24	$750 37	$944 78	$1,544,892 96	$61,314 21	$47,788 34	$3,953 64	$3,657 21	$12,497 11	$648 83	$648 64	$37,311 42	$5,292 72	$4,178 60	$1,564 35	$24,301 84	$19,243 29	$629 76	$1,861,835 83	16,318,237	$0 114	$88,633 16	$57,018 71	$18,080 61	$4,213 66	$2,584 26	$3,912 30	$174,478 70	$6,296 09		$76 34	$6,372 43	$2,012,686 96	$36,521 09	$2,006,165 87*	17,873	$111 25*	16,847	$119 08*	16,318,237	$0 122*	Totals.

[1] Including salary of matron.

[2] Includes South-Hughes Fund allotment ($1,500) and half the net cost of maintenance, as aid from the Commonwealth, for the period September 1, 1919, to August 31, 1920 ($4,245.65).

[3] Includes South-Hughes Fund allotment ($500).

[4] Includes half the net cost of maintenance, as aid from the Commonwealth, for the period January 1, 1920, to August 31, 1920 ($17,300 26).

[5] Includes Smith-Hughes Fund allotment ($1,500) and half the net cost of maintenance, as aid from the Commonwealth, for the period September 1, 1919, to August 31, 1920 ($6,078 32).

[6] Includes Smith-Hughes Fund allotment ($253 36) and half the net cost of maintenance, as aid from the Commonwealth for the Agricultural Department, for the period September 1, 1919, to August 31, 1920 ($1,248 46)

* EXCLUSIVE OF COSTS OF BUILDING, DEPRECIATION, REPAIRS, INTEREST AND SINKING FUND CHARGES.

SHEET NO. 2B.

ELEMENTARY SCHOOLS.

COST EXCLUSIVE OF ADMINISTRATION, SUPERVISION AND GENERAL CHARGES, AND WITH DIRECT INCOME DEDUCTED.

(For Total and Net Costs, see Sheet No. 1.)

COST OF DAY SCHOOLS, EXCLUSIVE OF ADMINISTRATION, SUPERVISION AND GENERAL CHARGES, AND WITH DIRECT INCOME DEDUCTED.*

ELEMENTARY SCHOOLS.*

[For Total and Net Costs, See Sheet No. 1.]

Schools.	Expenses of Instruction: Salaries of Principals.	Salaries of Clerks.	Postage	Telephone	Salaries of Teachers.	Salaries of Physical Education Teachers.	Text Books.	Supplementary and Reference Books	Drawing Supplies and Equipment.	Manual Training Supplies and Equipment.	Cookery Supplies and Equipment.	Sewing Supplies and Equipment.	Kindergarten Supplies	Musical Instruments and Supplies.	Printing	Miscellaneous Educational Supplies.	Physical Education Supplies and Equipment.	Incidentals.	Total for Instruction.	Number of Pupil Hours.	Cost per Pupil Hour of Instruction.	Operation of Plant: Salaries of Janitors.	Fuel.	Electric Light.	Electric Power.	Gas	Janitors' Supplies.	Total for Operation of Plant.	Promotion of Health: Salaries, School Physicians.	Nurses' Salaries.	Supplies, School Physicians and Nurses.	Blankets, Bath Expenses, etc.	Total for Promotion of Health.	Transportation: Car Tickets.	Total.	Direct Income.	Net Total.*	Average Membership.	Cost per Pupil, Average Membership.*	Average Attendance	Cost per Pupil, Average Attendance.*	Number of Pupil Hours.	Cost per Pupil Hour.*	Schools.
Abraham Lincoln	$4,012 00		$17 42	$27 58	$109,106 64	$350 83	$2,247 22	$676 55	$491 95	$494 33	$297 45	$41 41	$76 22	$325 00	$4 32	$2,156 84		$4 50	$120,333 27	1,802,489	$0 066	[1]$6,937 48	$5,091 73	$1,141 41	$85 20	$85 65	$161 88	$13,413 35	$743 33	$1,566 00	$60 98	$780 19	$3,150 50		$136,807 12	$22 89	$136,874 23*	2,200	$62 22*	2,047	$66 87*	1,802,489	$0 075*	Abraham Lincoln.
Agassiz	3,995 59	$54 00	6 71	4 77	19,764 56	129 20	917 57	151 30	187 99	695 00			3 30	69 94	391 75	27 27	540 41		27 96	56,880 31	611,728	092	3,806 40	2,113 35	84 27		74 04	74 71	7,452 77	385 62	957 12	2 65		1,345 39		63,678 47	266 60	65,411 87*	740	88 39*	687	95 21*	611,728	106*	Agassiz.
Bennett	4,012 00	76 50	7 56	69 48	94,566 24	103 15	1,444 72	325 79	497 99	561 28	231 33	38 56	150 45	3 00	17 80	1,168 70	$13 70	10 96	103,329 15	1,439,959	071	10,088 55	8,152 42	230 88	127 69	167 70	183 78	19,260 02	535 20	774 39	5 75		1,315 34		123,904 51	19 46	123,885 05*	1,804	68 67*	1,666	74 36*	1,439,959	086*	Bennett.
Bigelow	4,012 00		10 11	10 46	87,658 65	206 52	742 52	313 92	260 64	592 03	1 75	5 21	39 43	11 76	18 63	901 03	4 11	27 59	94,937 56	807,281	080	8,115 11	5,760 23	609 12	73 10	62 53	392 35	14,952 74	536 08	1,639 29	6 92		2,173 29	$102 85	111,944 70	184 55	111,760 24*	1,611	69 37*	1,181	75 16*	1,278,109	087*	Bigelow.
Blackinton-John Cheverus	3,811 00	76 80	6 39	84 53	85,633 94	310 69	1,189 71	340 45	484 85	714 01	275 66	46 73	356 73	342 66	2 23	1,015 76	11 50	0 67	91,715 91	1,278,109	072	8,115 11	5,760 23	609 12	73 10	62 53	392 35	14,952 74	536 08	1,639 29	6 92		2,173 29	$102 85	111,944 70	184 55	111,760 24*	1,611	69 37*	1,181	75 16*	1,278,109	087*	Blackinton-John Cheverus.
Bowditch	4,001 89	40 80	9 06	11 74	90,122 94	116 58	696 68	251 56	318 91	19 24	229 48	32 47	151 75	2 28	26 10	1,160 45	20 71	2 45	97,218 03	928,925	082	5,818 27	4,112 76	114 24	58 46	153 30	280 00	10,597 03	385 62	957 11	26 34		1,369 07	10 00	79,191 13	1 05	79,189 48*	1,169	67 74*	1,077	73 53*	928,925	085*	Bowditch.
Bowdoin	4,012 00	82 20	2 12	3 35	53,276 29	94 94	516 55	213 20	215 83	67 06	146 74	54 61	160 94	384 96	26 17	807 78	37 62	19 49	60,150 85	686,000	087	3,570 24	3,132 13	666 55		99 70	233 42	7,603 04	443 75	1,330 52	88 41		1,862 68	6 00	69,712 57	89	69,711 68*	878	79 40*	805	86 60*	686,000	101*	Bowdoin.
Bowdoin	4,012 00	82 20	9 06	27 87	85,428 22	254 75	1,043 24	719 78	325 25	342 15	223 62	32 50	168 88	301 95	7 18	1,010 58		2 25	73,991 72	1,028,393	071	4,717 40	2,882 03	625 38	Cr. 4 50	117 09	465 60	8,803 00	443 76	794 40	14 75		1,252 91		84,047 63	20 63	84,027 00*	1,281	65 54*	1,150	70 85*	1,028,393	081*	Chapman.
Chapman	4,012 00	82 20	9 06	27 87	85,428 22	254 75	1,043 24	719 78	325 25	342 15	223 62	32 50	168 88	301 95	7 18	1,010 58		2 25	73,991 72	1,028,393	071	4,717 40	2,882 03	625 38	Cr. 4 50	117 09	465 60	8,803 00	443 76	794 40	14 75		1,252 91		84,047 63	20 63	84,027 00*	1,281	65 54*	1,150	70 85*	1,028,393	081*	Chapman.
Charles Sumner	3,971 55		8 66	22 99	59,379 37	153 20	959 51	666 83	332 91	448 23	161 96	8 99	104 60	940 00	34 85	616 83	5 00	4 83	67,820 26	861,181	078	6,189 04	2,657 02	356 45	40 49	100 14	308 51	9,651 65	441 96	773 21	13 00		1,228 17	2 00	78,702 08	704 68	77,997 40*	1,084	71 95*	1,066	77 53*	861,181	090*	Charles Sumner.
Christopher Gibson	4,012 00	83 40	2 89	14 55	55,096 51	143 63	1,023 58	216 39	245 01	523 16	185 86	24 30	71 04		21 50	860 98	4 50	5 58	62,854 39	842,400	071	4,621 54	2,999 59	181 74	16 57	69 34	166 42	7,146 20	298 41	522 00	3 78		824 19	17 00	70,841 78	83 65	70,756 13*	1,047	67 58*	942	73 40*	842,400	083*	Christopher Gibson.
Dearborn	3,559 67	78 00	8 61	70 84	104,312 12	156 66	1,234 41	1,096 97	569 56	1,701 31	255 01	24 48	111 47	179 29	30 24	1,459 32	Cr. 15 47	32 82	114,805 85	1,587,817	072	8,154 55	7,760 94	505 94	30 02	210 19	392 25	17,059 29	660 45	1,287 86	110 37		2,058 68		133,923 82	27 45	133,896 37*	1,929	69 41*	1,803	74 26*	1,587,817	084*	Dearborn.
Dillaway	3,709 68	83 40	30 56	38 80	65,749 94	89 75	1,004 63	439 70	321 14	49 02	269 45	31 95	95 02	3 68		1,037 90	70 36	2 24	73,088 81	1,013,363	072	5,891 02	5,300 99	529 58	8 70	119 47	411 50	12,355 16	438 94	777 83	25 48		1,242 25		86,688 22	2 16	86,686 06*	1,254	69 13*	1,145	76 37*	1,013,363	085*	Dillaway.
Dudley	4,012 00		17 60	47 51	71,962 87	63 22	441 45	691 55	253 04	1,178 87	2 94	19 93	118 18	561 07	30 00	803 58	11 49	44 98	80,265 68	992,630	080	7,510 51	8,587 88	320 95	232 30	22 76	405 64	17,080 05	438 94	777 83	11 65		1,228 42	180 00	98,754 15	11 43	98,742 72*	1,226	80 54*	1,130	87 38*	992,630	099*	Dudley.
Dudley	3,684 92		24 00	46 40	52,457 73	69 22	918 23	483 54	294 26	472 66	237 91	357 41	130 27	341 30	29 12	1,125 01	80 85	13 89	60,466 72	690,235	087	4,016 77	2,853 24	506 29	14 26	108 42	268 65	7,766 63	342 71	773 61	50 85		1,157 17	700 00	70,090 52	40 26	70,050 26*	854	82 03*	780	88 00*	690,235	101*	Dudley.
Dwight	4,012 00		17 60	47 51	71,962 87	63 22	441 45	691 55	253 04	1,178 87	2 94	19 93	118 18	561 07	30 00	803 58	11 49	44 98	80,265 68	992,630	080	7,510 51	8,587 88	320 95	232 30	22 76	405 64	17,080 05	438 94	777 83	11 65		1,228 42	180 00	98,754 15	11 43	98,742 72*	1,226	80 54*	1,130	87 38*	992,630	099*	Dwight.
Edmund P. Tileston	4,131 39	57 60	7 10	11 87	52,256 97	143 62	931 82	206 95	264 22	636 65	156 23	89 25	108 52	1 06		742 89		5 26	59,751 70	720,463	082	4,100 24	2,677 24	79 39	56 00	85 41	82 88	6,781 15	536 77	891 12	9 53		1,437 42		67,970 27	82 02	67,887 25*	909	74 68*	837	81 11*	720,463	094*	Edmund P. Tileston.
Edward Everett	4,012 00	66 60	16 75	15 53	86,884 04	181 09	1,768 60	209 49	548 26	142 02	260 65	18 56	124 12	300 98		1,039 54		17 90	96,006 76	1,328,812	072	7,316 40	7,671 37	303 19	9 30	242 28	437 31	15,979 85	443 75	1,539 14	10 00		1,992 89		113,979 50	10 02	113,969 48*	1,625	70 14*	1,522	74 85*	1,328,812	085*	Edward Everett.
Ellen Grew wood	3,733 20		14 50	10 70	71,139 20	181 69	1,663 92	1,172 07	317 25	680 62	183 91	21 55	89 76	950 00	9 11	1,252 84	10 88	5 45	82,854 39	1,169,552	071	5,994 16	7,171 05	2,164 87	226 70	201 69	376 00	16,435 67	892 00	1,744 42	34 40		2,670 82		101,009 74	74 34	100,935 40*	2,789	53 78*	2,599	60 94*	2,353,700	069*	Ellen Grew wood.
Eliot	4,012 00	62 40		40 68	132,350 28	53 39	1,234 89	1,180 38	786 28	1,335 39		2 73	130 31	51 66	39 36	3,599 62		23 87	144,903 25	2,353,700	061	5,994 16	7,171 05	2,164 87	226 70	201 69	376 00	16,435 67	892 00	1,744 42	34 40		2,670 82		161,009 74	74 34	160,935 40*	2,789	53 78*	2,599	60 94*	2,353,700	069*	Eliot.
Emerson	4,012 00	78 60	10 96	11 86	78,991 47	350 84	1,160 90	222 12	404 14	451 41	211 34	7 19	113 57	11 08	6 42	1,907 72	24 64	2 28	88,151 84	1,233,884	071	6,282 20	3,838 62	795 45	60 79	56 14	219 60	11,253 08	444 76	794 40	15 60		1,253 82		100,658 74	6 97	100,651 77*	1,546	65 10*	1,426	70 58*	1,233,884	081*	Emerson.
Everett	3,210 74		11 52	18 72	12,589 11	94 95	833 59	175 15	216 18	77 77	246 83	35 15	42 76	300 00	17 80	840 71		44	48,717 75	675,269	072	3,562 81	4,051 96	410 18	22 76	61 42	213 40	8,382 53	332 70	773 59	6 11		1,112 40		58,212 68	2 19	58,210 49*	853	68 24*	773	75 30*	675,269	086*	Everett.
Fred. L. Parkman	4,012 00	25 89	8 20	10 34	36,349 01	153 20	529 17	305 87	210 31	318 73	175 46	29 01	86 90	300 98	27 24	650 90		2 95	43,168 47	611,365	070	3,339 20	4,018 19	313 71	245 60	38 46	147 32	8,093 48	411 96	773 20	10 05		1,225 21		53,087 16	20 04	53,067 12*	760	69 83*	717	74 01*	611,365	086*	Francis Parkman
Franklin	4,012 00	38 55	11 76	22 16	61,018 04	91 86	822 00	672 16	160 84	64 84	189 28	34 98	86 95	335 65	69 65	822 88	53 23	4 96	68,531 72	876,691	078	4,620 85	3,833 48	697 53	78 17	61 68	271 01	9,560 02	455 38	783 00	24 47		1,262 85	275 00	79,635 59	4 99	79,630 60*	1,113	71 55*	1,019	78 15*	876,691	090*	Franklin.
Frederic W. Lincoln	3,455 19		11 50	20 74	42,945 30	149 34	671 20	362 73	179 80	541 92	1 04		93 59	325 98	23 50	710 36	9 50	2 46	49,204 15	630,027	078	3,739 54	1,924 03	224 58		22 86	265 84	6,176 85	304 24	590 69	42 11		1,096 95	6 40	56,484 35	117 65	56,366 70*	779	72 36*	733	76 90*	630,027	089*	Frederic W. Lincoln.
Gaston	3,781 33	41 40	7 00	13 09	56,851 36	118 82	955 05	496 13	288 19	31 44	259 17	19 74	33 07		27 14	704 40	38 00	9 00	63,757 19	881,402	072	4,238 82	4,036 61	231 41	2 59	81 41	190 56	8,781 34	493 25	778 07	11 34		1,282 66	7 50	73,828 69	3 84	73,824 85*	1,066	69 25*	1,006	73 38*	881,402	083*	Gaston.
George Putnam (Intermediate)	4,012 00	85 20	7 00	10 77	88,777 22	188 74	1,203 19	784 89	384 83	1,091 06	233 26	08 03	69 48	335 00	31 58	1,867 12	2 58	8 64	91,189 09	1,223,058	074	6,363 58	6,293 12	514 38	12 40	224 01	395 87	13,803 96	481 37	741 87	11 64		1,237 68		106,230 73	72 25	106,158 48*	1,462	72 61*	1,346	78 87*	1,223,058	086*	George Putnam (Intermediate).
Gilbert Stuart	4,012 00	31 20	8 30	71 57	46,107 18	143 63	800 45	689 49	251 60	339 82	149 26	21 25	83 18	65	90	553 46		1 92	53,055 85	647,285	082	5,906 36	2,228 78	145 06	199 33	76 85	149 62	7,857 00	532 51	805 34	13 58		1,351 43		62,264 29	71 18	62,793 11*	821	76 48*	755	83 17*	647,285	097*	Gilbert Stuart.
Hancock	3,991 78	836 29	7 17	65 57	142,019 45	173 24	2,092 72	725 59	650 71	112 26	518 98	287 59	296 34	321 96	41 05	1,870 25		75 60	154,119 37	2,102,710	073	[1]8,036 38	6,352 34	2,574 40	118 30	231 19	507 83	17,820 44	856 17	1,747 87	67 63	885 20	3,556 27	3 00	175,496 08	38 54	175,460 54*	2,659	65 99*	2,521	69 60*	2,102,710	083*	Hancock.
Harvard-Frothingham	4,012 00	148 65	12 48	19 75	74,130 65	114 90	752 47	397 71	384 49	676 48	253 76	113 26	181 39	15 91	42 54	1,095 56	15 97	7 58	82,309 53	973,920	084	7,977 32	4,469 79	850 07		210 63	235 23	13,734 04	510 63	959 78	50 28		1,520 09	129 85	97,694 53	4 99	97,689 54*	1,440	85 09*	1,340	90 86*	973,920	100*	Harvard-Frothingham.
Henry Grew	4,012 00		7 00	50 23	49,053 90	214 59	523 87	461 60	245 59	297 36	132 08	33 07	76 61	1 95	25 85	466 21		1 66	45,604 17	646,255	070	4,272 06	2,804 72	202 78		48 69	104 59	7,432 75	346 90	781 27	12 09		1,140 26	8 50	54,185 68	19 01	54,166 67*	842	64 33*	763	70 99*	646,255	083*	Henry Grew.
Henry L. Pierce	3,956 73	71 40	8 50	13 19	98,547 14	262 90	1,751 49	653 10	631 20	495 80	305 71	75 59	136 94	498 96	45 85	1,824 13	91 36	6 19	109,429 18	1,487,804	073	8,791 58	4,429 22	527 75	123 84	182 06	468 65	14,523 10	892 00	1,613 71	19 49		2,525 20		126,477 48	40 63	126,436 85*	1,836	68 87*	1,704	74 20*	1,487,804	084*	Henry L. Pierce.
Hugh O'Brian	4,012 00	80 40	14 31	22 29	82,971 56	222 71	1,338 37	675 39	425 68	350 57	233 31	22 78	78 42	625 00	41 68	1,707 79	7 50	8 39	92,928 05	1,345,879	069	6,706 04	6,071 34	262 74	9 00	103 80	293 48	14,439 39	443 75	1,044 00	20 21		1,507 96		108,875 40	21 53	108,853 87*	1,676	64 95*	1,563	69 64*	1,345,879	080*	Hugh O'Brien.
Hyde	4,012 00	79 80	11 74	15 41	47,160 27	116 58	514 05	178 28	177 07	52 90	323 28	151 92	110 69		2 43	574 94		2 66	53,812 11	622,697	086	3,945 89	2,645 17	239 34	5 62	123 35	143 92	7,123 29	399 70	639 32	14 86		1,053 88	5 00	61,094 28	1 70	61,092 49*	895	77 01*	828	85 15*	622,697	099*	Hyde.
Jefferson	4,012 00	33 60	7 04	11 95	80,376 07	152 81	969 68	185 00	380 92	666 98	286 96	98 78	136 49	5 22	10 09	1,222 84	7 74	8 17	88,603 84	1,181,069	075	6,951 88	4,671 24	569 76	56 06	60 72	194 76	12,504 42	446 00	1,559 12	26 36		2,031 48	9 40	103,149 14	31 28	103,117 86*	1,452	71 04*	1,368	75 38*	1,181,069	087*	Jefferson.
John A. Andrew	3,859 67	78 60	6 79	12 61	84,187 89	129 20	491 94	169 79	319 23	346 16	196 [illegible]	8 50	50 77	3 26	24 99	659 38		1 95	54,298 05	884,649	061	4,093 19	2,[illegible]	297 86		54 91	267 51	7,047 33	446 00	899 32	6 17		1,351 49		62,696 87	14 60	62,682 27*	1,069	58 64*	1,006	62 31*	884,649	070*	John A. Andrew.
John Marshall	3,532 91	61 80	7 78	26 60	69,650 83	113 62	874 40	1,042 98	380 51	255 26		68 12	182 22	11 95	[illegible]	887 50	11 47	7 21	77,163 00	1,080,102	071	5,359 94	3,655 87	663 77	102 30	18 81	300 18	10,036 87	446 00	786 55	10 37		1,248 92		88,408 79	2 57	88,406 22*	1,375	64 30*	1,254	70 50*	1,080,102	081*	John Marshall.
John Winthrop	3,615 99	81 00	11 83	8 09	90,122 69	213 45	1,206 80	969 10	695 88	413 03	177 61	43 32	72 65	1 63	29 37	1,731 50	92 52	1 63	99,497 06	1,394,356	071	7,294 56	6,744 07	611 14		150 16	289 34	15,089 27	446 00	775 25	13 20		1,234 45		115,820 78	7 00	115,813 69*	1,751	66 14*	1,600	72 38*	1,394,356	083*	John Winthrop.
John Ward Howe	3,686 46		4 60	29 80	53,025 75	101 85	636 38	599 65	368 97	332 13			11 70	40 72	17 61	2 88	938 77	28 61	7 22	59,770 20	897,428	066	5,448 82	4,465 98	400 95	131 03	86 63	210 70	10,744 11	444 88	783 00	41 25		1,269 13		69,317 35	35 88	69,281 47*	871	79 57*	843	82 18*	750,879	092*	John Ward Howe.
Lawrence	3,781 33		17 96	34 18	50,328 28	87 14	912 84	233 74	264 72	923 06			10 14	65 86	10 00	28 44	703 07	Cr. 105 00	8 37	57,304 11	750,879	076	5,643 20	6,879 09	588 70	18 25	67 20	525 16	13,721 60	371 57	780 65	20 07		1,173 19		110,054 00	13 01	110,040 99*	1,636	67 26*	1,463	75 21*	1,275,236	086*	Lawrence.
Lewis (Intermediate)	4,012 00		10 62	44 40	85,054 64	174 23	2,223 25	607 63	427 43	654 18	258 73	65 58	128 99	10 76		1,479 07	2 50	9 23	95,159 21	1,275,236	074	5,643 20	6,879 09	588 70	18 25	67 20	525 16	13,721 60	371 57	780 65	20 07		1,173 19		110,054 00	13 01	110,040 99*	1,636	67 26*	1,463	75 21*	1,275,236	086*	Lewis (Intermediate).
Longfellow	3,976 61	45 60	4 94	2 63	69,969 53	154 20	1,519 87	444 16	431 80	274 99	251 91	20 57	71 68	8 02	59 30	1,071 34	10 50	3 93	78,240 78	1,114,455	070	6,038 09	3,433 34	521 36		104 75	263 98	10,362 02	446 00	780 52	64 57	6 00	1,297 09	3 80	85,854 71	7 67	85,847 04*	1,217	70 57*	1,146	74 73*	990,318	086*	Longfellow.
Lowell	4,012 00	81 00	11 50	11 51	66,151 30	152 82	904 52	395 56	357 99	651 49	278 39	97 29	72 77	7 00	29 00	721 59	50 19	3 97	73,991 50	990,318	074	6,038 09	3,433 34	521 36		104 75	263 98	10,362 02	446 00	780 52	64 57	6 00	1,297 09	3 80	85,854 71	7 67	85,847 04*	1,217	70 57*	1,146	74 73*	990,318	086*	Lowell.
Marion	4,398 00	1,254 51	11 87	42 62	44,402 63	201 14	151 12	466 54	196 14	289 87	129 84	21 82	76 77	20 76	48 80	694 39	15 43	3 87	52,462 17	505,178	103	6,045 55	3,203 43	273 22	186 90	36 92	243 48	9,988 70	446 00	778 60	18 07		1,242 67	103 00	63,776 34	26 21	63,770 13*	650	98 11*	598	106 64*	505,178	126*	Marion.
Mary Hemenway	4,012 00		10 67	12 01	116,305 48	240 18	1,614 02	511 88	679 52	517 28	412 49	104 12	66 41	47 41	7 19	1,801 30	30 00	23 31	126,428 57	1,834,704	068	9,714 26	5,011 72	395 16	166 55	273 80	392 32	16,083 81	892 00	1,208 79	21 39		2,122 18	6 00	144,620 56	16 46	144,604 10*	2,294	63 03*	2,112	68 47*	1,834,704	078*	Mary Hemenway.
Mather	4,012 00	84 00	7 50	45 59	134,067 99	159 45	2,202 68	786 22	723 07	1,322 27	291 02	41 21	73 12	038 27	38 32	1,382 87	27 64	15 78	146,008 61	2,181,036	066	10,570 24	11,413 15	394 37	42 45	126 22	443 12	22,989 55	892 00	1,345 68	53 70		2,293 38		171,291 87	199 91	171,091 96*	2,653	64 49*	2,480	68 96*	2,181,036	078*	Mather.
Minot	4,012 00		11 25	20 68	29,052 32	60 66	602 25	40 78	190 64	222 58	85 25	30 12	20 34	3 55	23 99	666 58	2 50	1 35	35,546 85	481,807	073	3,127 13	1,752 42	192 02		11 02	95 95	5,181 54	355 01	850 17	12 19		1,217 37		42,945 76	11 20	42,934 56*	603	69 71*	555	75 74*	481,807	087*	Minot.
Norcross	3,781 33	63 00	8 40	18 09	61,620 09	128 22	859 79	371 65	279 41	68 37	250 01	10 85	138 66	3 91	30 30	800 12	19 05	11 05	67,372 82	860,158	078	5,116 80	3,731 96	659 20	66 05	151 68	274 88	9,999 97	444 87	783 00	8 48	42 27	1,276 62	43 25	79,192 66	1 05	79,191 01*	1,059	74 78*	998	79 45*	860,158	092*	Norcross.
Oliver Hazard Perry	3,991 67		4 98		48,319 36	119 34	830 84	282 25	244 85	300 30	191 77	61 35	29 99	9 41	26 24	881 22	22 14	2 59	55,319 39	673,312	052	4,092 40	3,320 31	185 09	9 00	27 25	141 61	7,775 57	304 24	750 60	9 26		1,064 10		64,158 97	15 10	64,143 87*	829	77 37*	771	83 19*	673,312	095*	Oliver Hazard Perry.
Oliver Wendell Holmes (Intermediate)	3,675 86	91 80	17 85	1 00	68,937 17	262 90	2,744 94	294 62	344 76	1,179 39	343 94	40 81	1 14	325 00	13 00	2,004 83	28 50	1 47	80,366 27	871,273	092	5,134 72	3,577 28	419 70	110 60	67 63	242 46	9,562 39	446 00	786 53	12 30		1,244 83	12 40	91,185 89	149 20	91,036 69*	1,041	87 45*	979	92 99*	871,273	104*	Oliver Wendell Holmes (Intermediate).
Phillips Brooks	4,012 00	79 80	2 50	30 88	84,206 02	129 20	1,642 41	525 05	336 54	265 34	216 54	22 33	151 10	123 46	26 87	1,369 62	23 25	9 25	93,335 55	1,310,477	071	6,888 64	1,343 65	216 20	114 39	113 35	256 16	11,032 39	446 00	775 25	8 57		1,229 82	60	106,498 36	17 58	106,480 78*	1,707	62 38*	1,541	69 10*	1,310,477	081*	Phillips Brooks.
Prescott	3,802 00	28 80	9 06	20 51	40,597 03	114 90	547 45	210 78	258 43	1,025 39	142 05	60 17	Cr 17 09	0 90		223 59	16 74	17 49	48,000 17	582,759	082	3,401 56	3,622 67	353 38	33 22	80 90	169 83	7,661 56	307 33	692 34	15 23		1,014 90		56,676 63	675 46	56,001 17*	704	79 55*	668	85 11*	582,759	096*	Prescott.
Prince	4,012 00		5 40	6 89	52,580 78	179 38	940 24	424 35	388 28	456 44	268 29	33 44	64 25	2 28	42 37	815 51		6 33	60,415 83	803,294	075	4,066 40	3,566 84	731 26	9 60	118 56	173 09	8,106 05	353 58	854 71	10 64		1,218 93		69,740 81	11 05	69,729 76*	1,009	69 11*	910	76 62*	803,294	086*	Prince
Quincy	4,007 42	60 10	12 26	26 86	79,076 13	61 83	857 79	443 94	384 85	957 40		7 58	151 05	13 96	6 60	849 59	10 21	44 12	87,358 74	960,642	090	5,304 55	4,087 32	1,292 78	11 46	114 14	303 22	11,113 47	544 69	1,596 00	136 92		2,247 61	2 40	100,722 22	67 52	100,654 70*	1,248	81 36*	1,146	87 84*	960,642	104*	Quincy.
Rice	4,012 00	78 60	8 79	12 81	48,066 97

SHEET NO. 3A.

SPECIAL SCHOOLS AND CLASSES.

COST EXCLUSIVE OF ADMINISTRATION, SUPERVISION AND GENERAL CHARGES, AND WITH DIRECT INCOME DEDUCTED.

(For Total and Net Costs, see Sheet No. 1.)

COST OF DAY SCHOOLS EXCLUSIVE OF ADMINISTRATION, SUPERVISION, AND GENERAL CHARGES, AND WITH DIRECT INCOME DEDUCTED.*—*Continued.*

HORACE MANN SCHOOL.*

[For Total and Net Costs, See Sheet No. 1.]

School.	Expenses of Instruction: Salary of Principal	Salaries of Clerks.	Postage.	Telephone.	Salaries of Teachers	Salaries of Physical Education Teachers	Text Books	Supplementary and Reference Books.	Drawing Supplies	Manual Training Supplies and Equipment	Cookery Supplies and Equipment.	Sewing Supplies.	Kindergarten Supplies	Music Supplies	Printing	Miscellaneous Educational Supplies.	Physical Education Supplies.	Incidentals.	Total for Instruction.	Number of Pupil Hours.	Cost per Pupil Hour of Instruction.	Operation of Plant: Salary of Janitor	Fuel	Electric Light.	Electric Power	Gas.	Janitors' Supplies	Total for Operation of Plant.	Promotion of Health: Salaries of School Physicians.	Nurses' Salaries.	Supplies, School Physicians and Nurses.	Total for Promotion of Health.	Transportation: Traveling Expenses of Pupils	Total.	Direct Income	Net Total.*	Average Membership.	Cost per Pupil, Average Membership.*	Average Attendance	Cost per Pupil, Average Attendance.*	Number of Pupil Hours	Cost per Pupil Hour.*	School.
Horace Mann School.	$3,832 00	. . . .	$20 00	$9 78	$35,544 04	$60 56	$75 00	$76 61	$50 40	$65 38	$122 11	$17 13	$14 10	. . . . .	$32 17	$257 96	. . . . .	$3 30	$39,880 24	122,200	$0 326	$2,434 30†	$1,080 08	$932 20	$30 00	$55 98	$90 61	$4,638 23	$648 67	$369 91	$2 99	$1,021 57	$3,959 82	$49,499 86	$3,950 11	$45,549 72*	153	$297 71*	136	$334 92*	122,200	$0 372*	Horace Mann School.

† Including salary of matron.

BOSTON CLERICAL SCHOOL.*

[For Total and Net Costs, See Sheet No. 1.]

School.	Expenses of Instruction: Salary of Principal.	Salaries of Clerk.	Postage	Telephone	Salaries of Teachers	Salaries of Physical Education Teachers.	Text Books.	Supplementary and Reference Books.	Drawing Supplies.	Manual Training Supplies	Commercial Supplies and Equipment.	Printing	Miscellaneous Educational Supplies.	Physical Education Supplies.	Incidentals.	Total for Instruction.	Number of Pupil Hours.	Cost per Pupil Hour of Instruction.	Operation of Plant: Salary of Janitor.	Fuel.	Electric Light.	Electric Power.	Gas.	Janitors' Supplies	Total for Operation of Plant.	Promotion of Health: Salaries of School Physicians	Nurses' Salaries.	Supplies, School Physicians and Nurses.	Total for Promotion of Health.	Total.*	Average Membership.	Cost per Pupil, Average Membership.*	Average Attendance.	Cost per Pupil, Average Attendance.*	Number of Pupil Hours.	Cost per Pupil Hour.*	School.
Boston Clerical School	$1,174 50	$278 40	$33 48	$13 22	$18,905 23	. . . . .	$515 49	$75 50	. . . .	. . . .	$3,421 10	$73 00	$231 41	. . . . .	$0 99	$24,782 41	167,049	$0 148	$760 01	$282 39	$153 69	$5 61	. . .	$23 31	$1,227 91	$178 40	. .	. . . .	$178 40	$26,188 72*	185	$141 56*	171	$153 15*	167,049	$0 156*	Boston Clerical School.

BOSTON DISCIPLINARY DAY SCHOOL.*

[For Total and Net Costs, See Sheet No. 1.]

School.	Expenses of Instruction: Salaries of Teachers.	Postage.	Telephone	Text Books	Supplementary and Reference Books.	Drawing Supplies.	Miscellaneous Educational Supplies.	Physical Education Supplies.	Incidentals.	Total for Instruction.	Number of Pupil Hours	Cost per Pupil Hour of Instruction.	Operation of Plant: Salary of Janitor.	Fuel.	Electric Light.	Electric Power.	Gas	Janitors' Supplies	Total for Operation of Plant.	Promotion of Health: Salaries of School Physicians.	Nurses' Salaries.	Supplies, School Physicians and Nurses.	Total for Promotion of Health.	Transportation: Car Tickets.	Total.*	Average Membership.	Cost per Pupil, Average Membership.*	Average Attendance.	Cost per Pupil, Average Attendance.*	Number of Pupil Hours	Cost per Pupil Hour.*	School.
Boston Disciplinary Day School . .	$6,400 55	. . . . .	$1 60	$58 69	$46 62	. . . . .	$52 04	. . . . .	$44 10	$6,603 60	30,335	$0 217	$346 07	$490 14	$20 40	. . . . .	$22 56	$18 57	$897 83	. . .	. . . . .	. . . . .	. . .	$475 00	$7,970 43*	45	$177 25*	34	$234 60*	30,335	$0 262*	Boston Disciplinary Day School.

TRADE SCHOOL FOR GIRLS.*

[For Total and Net Costs, See Sheet No. 1.

School.	Expenses of Instruction: Salary of Principal.	Salaries of Clerks	Office Supplies and Equipment.	Postage	Telephone	Salaries of Teachers	Salaries of Physical Education Teachers	Books and Subscriptions.	Drawing Supplies and Equipment	Manual Training Supplies and Equipment	Cookery Supplies and Equipment	Sewing Supplies and Equipment.	Printing.	Miscellaneous Educational Supplies.	Physical Education Supplies	Car Fares, Expressage and Incidentals.	Advertising.	Total for Instruction.	Credit for Work Done for Other Units of the School System	Net Total for Instruction.	Number of Pupil Hours.	Cost per Pupil Hour of Instruction.	Operation of Plant: Salary of Janitor.	Fuel	Electric Light.	Electric Power.	Gas	Janitors' Supplies.	Total for Operation of Plant.	Promotion of Health: Salaries, School Physicians	Nurses Salaries.	Supplies, School Physicians and Nurses	Total for Promotion of Health.	Auditing Accounts	Total.	Direct Income.†	Net Total.*	Number of Pupil Hours.	Cost per Pupil Hour.*	School.
Trade School for Girls	$4,012 00	$2,756 67	$383 55	$26 56	$103 35	$71,659 78	. . .	$1 05	$103 36	. . . . .	$3,193 64	$4,651 20	$292 28	$140 73	$6 50	$525 68	. . . . .	$87,856 35	. . . .	$87,856 35	421,791	$0 205	$3,426 76	$1,821 40	$1,032 97	$206 20	$127 67	$110 42	$7,088 42	$289 79	$173 12	$4 28	$767 19	$83 33	$95,795 29	$51,087 73†	$44,707 56*	424,791	$0 105*	Trade School for Girls.

† Includes half the net cost of maintenance as aid from the Commonwealth for the period September 1, 1919, to August 31, 1920 ($30,702 13), sale of materials ($13,559 97), Smith-Hughes Fund allotment ($6,825 63), etc. The above cost includes Regular, Summer and Extension Classes.

BOSTON TRADE SCHOOL, DAY CLASSES.*

[For Total and Net Costs, See Sheet No. 1.]

School.	Expenses of Instruction: Salary of Principal.	Salaries of Clerks.	Office Supplies and Equipment.	Postage	Telephone	Traveling Expenses of Principal	Salaries of Teachers	Salaries of Physical Education Teachers	Books and Subscriptions.	Drawing Supplies and Equipment.	Manual Training Supplies and Equipment.	Printing	Miscellaneous Educational Supplies.	Physical Education Supplies	Car Fares and Incidentals.	Total for Instruction.	Credit for Work Done for Other Units of the School System.	Net Total for Instruction.	Number of Pupil Hours.	Cost per Pupil Hour of Instruction.	Operation of Plant: Salary of Janitor.	Fuel.	Electric Light	Electric Power	Gas.	Janitors' Supplies.	Total for Operation of Plant.	Promotion of Health: Salaries, School Physicians	Nurses' Salaries.	Supplies, School Physicians and Nurses	Total for Promotion of Health.	Auditing Accounts.	Total.	Direct Income †	Net Total.*	Average Membership.	Cost per Pupil, Average Membership.*	Average Attendance	Cost per Pupil, Average Attendance.*	Number of Pupil Hours.	Cost per Pupil Hour.*	School
Boston Trade School, Day Classes. . .	$4,275 00	$3,132 65	$361 77	$81 78	$237 76	. . . . .	$64,191 90	$1,619 90	$2,036 64	$1,128 94	$11,661 39	$28 14	$1,003 41	$1,139 25	$476 25	$91,374 78	$748 51	$90,626 27	531,032	$0 170	$6,952 94	$5,889 92	$318 70	. . . .	$595 16	$353 41	$14,110 12	$174 00	. . .	$21 25	$198 25	$83 33	$105,017 97	$37,827 46†	$67,190 51*	429	$156 62*	398	$168 82*	531,032	$0 126*	Boston Trade School, Day Classes.

† Includes half the net cost of maintenance as aid from the Commonwealth for the period September 1, 1919, to August 31, 1920 ($28,874.66), sale of materials and work done ($4,020.36), Smith-Hughes Fund allotment ($4,694 28), etc.

BOSTON TRADE SCHOOL, SUMMER REHABILITATION CLASSES FOR FEDERAL STUDENTS.†

[For Total and Net Costs, See Sheet No. 1.]

School.	Expenses of Instruction: Salary of Principal.	Salary of Clerk.	Salaries of Teachers	Manual Training Supplies	Drawing Supplies.	Miscellaneous Educational Supplies.	Books and Subscriptions.	Postage	Incidentals	Total for Instruction.	Operation of Plant: Salary of Janitor.	Janitors' Supplies	Total for Operation of Plant.	Total.*	School.
Boston Trade School, Summer Rehabilitation Classes for Federal Students.	. . . . .	$200 00	$4,163 00	$414 67	$87 52	$45 88	$163 68	. . . .	$0 33	$5,075 08	$312 40	$7 70	$320 10	$5,395 18*	Boston Trade School, Summer Rehabilitation Classes for Federal Students.

† The cost of conducting the above classes was paid over to the School Committee by the United States Veterans Bureau.

*EXCLUSIVE OF COSTS OF BUILDING, DEPRECIATION, REPAIRS, INTEREST AND SINKING FUND CHARGES.

SHEET NO. 3B.

SPECIAL SCHOOLS AND CLASSES.

COST EXCLUSIVE OF ADMINISTRATION, SUPERVISION AND GENERAL CHARGES, AND WITH DIRECT INCOME DEDUCTED.

(For Total and Net Costs, see Sheet No. 1.)

COST OF DAY SCHOOLS EXCLUSIVE OF ADMINISTRATION, SUPERVISION, AND GENERAL CHARGES, AND WITH DIRECT INCOME DEDUCTED.*—*Continued.*

COMPULSORY CONTINUATION SCHOOL.*

[For Total and Net Costs, See Sheet No. 1.]

School.	Expenses of Instruction: Salary of Principal	Salaries of Clerks.	Office Supplies and Equipment.	Postage	Telephone	Traveling Expenses of Principal.	Salaries of Teachers	Salaries of Physical Education Teachers	Books and Subscriptions	Drawing Supplies and Equipment	Manual Training Supplies and Equipment	Commercial Supplies and Equipment	Cookery Supplies and Equipment	Sewing Supplies and Equipment	Musical Instruments and Supplies.	Printing	Miscellaneous Educational Supplies	Physical Education Supplies	Incidentals	Total for Instruction.	Credit for Work Done for Other Units of the School System	Net Total for Instruction.	Number of Pupil Hours	Cost per Pupil Hour of Instruction.	Operation of Plant: Salary of Janitor	Fuel	Electric Light	Electric Power	Gas	Janitors' Supplies	Total for Operation of Plant.	Promotion of Health: Salaries, School Physicians	Nurses' Salaries	Supplies, School Physicians and Nurses	Total for Promotion of Health.	Transportation: Car Tickets	Auditing Accounts.	Total.	Direct Income †	Net Total.*	Number of Pupil Hours.	Cost per Pupil Hour.*	School.
Compulsory Continuation School	$3,312 00	$5,693 38	$35 10	$335 00	$538 24	.....	$123,449 18	.....	$65 13	$287 10	$3,598 24	$2,366 71	$570 65	$1,390 51	$825 09	$37 65	$291 88	$34 75	$98 39	$144,978 31	$39 30	$144,459 01	565,915	$0 251	$1,581 05	$2,151 91	$1,711 91	$526 47	$42 13	$212 74	$6,531 21	.....	$132 00	.....	$132 00	$570 00	$83 31	$152,696 21	$87,453 18†	$67,243 03*	565,915	$0 119*	Compulsory Continuation School

† Includes half the net cost of maintenance as aid from the Commonwealth for the period September 1, 1919, to August 31, 1920 ($56,724 05), sale of materials and work done ($1,218 92), southern Juniors Fuel Allotment ($27,591 88), etc. The number of follow-up visits made in 1921 was 9,952. The decimal figure in the pupil hour and

SPEECH IMPROVEMENT CLASSES.*

[For Total and Net Costs, See Sheet No. 1.

School.	Expenses of Instruction: Salaries of Teachers.	Salaries of Clerks.	Office Supplies and Equipment.	Postage	Telephone	Text Books	Supplementary and Reference Books	Musical Instruments and Supplies	Drawing Supplies	Sewing Supplies	Printing	Miscellaneous Educational Supplies	Physical Education Supplies	Carfares and Incidentals	Total for Instruction.	Operation of Plant: Salary of Janitors	Fuel	Electric Light	Electric Power	Gas	Janitors' Supplies	Total for Operation of Plant.	Promotion of Health: Salaries, School Physicians	Supplies, School Physicians and Nurses	Total for Promotion of Health.	Transportation: Car Tickets	Total.	Direct Income	Net Total.*	School.
Speech Improvement Classes	$20,720 83	$19 89	$82 50	$23 00	$12 50	$213 18	$153 86	.	$10 30	$9 30	$217 97		$11 15	$21,538 99	$1,716 73	$955 15	$122 97	$61 90	$15 55	$58 65	$2,930 95	$165 00	$1 86	$166 86	$3 00	$24,629 20		$24,629 20*	Speech Improvement Classes.

DAY SCHOOL FOR IMMIGRANTS.*

[For Total and Net Costs, See Sheet No. 1.]

School.	Expenses of Instruction: Salaries of Teachers.	Office Supplies and Equipment.	Text Books	Supplementary and Reference Books.	Postage	Printing	Miscellaneous Educational Supplies.	Total for Instruction.	Number of Pupil Hours	Cost per Pupil Hour of Instruction.	Operation of Plant: Salaries of Janitors	Fuel	Electric Light	Electric Power.	Gas	Janitors' Supplies	Total for Operation of Plant.	Transportation: Car Tickets	Total.	Direct Income †	Net Total.*	Number of Pupil Hours	Cost per Pupil Hour.*	School
Day School for Immigrants	$13,697 20	$150 45	$295 36	$96 75	$25 03	$2 55	$487 52	$14,754 86	111,505	$0 132	$741 50	$194 70	$31 30	$3 72	..	$970 22	$29 80	$15,754 88	$8,322 98†	$7,431 90*	111,505	$0 066*	Day School for Immigrants

† Aid for Americanization from the Commonwealth, $8,322.98

CLASSES IN RECREATIONAL HANDICRAFTS.*

	Expenses of Instruction: Salaries of Teachers	Manual Training Supplies	Drawing Supplies	Incidentals.	Total *	
Classes in Recreational Handicrafts	$866 00	$218 42	$4 50	$2 04	$889 05*	Classes in Recreational Handicrafts.

TRAINING SCHOOL FOR TEACHERS OF MECHANIC ARTS.*

	Expenses of Instruction: Salaries of Teachers	Text Books.	Manual Training Supplies	Drawing Supplies	Total *	
Training School for Teachers of Mechanic Arts	$1,315 41	$24 82	$27 10	$33 03	$1,124 16*	Training School for Teachers of Mechanic Arts.

SUMMER REVIEW HIGH SCHOOL.*

[For Total and Net Costs, See Sheet No. 1.]

School.	Expenses of Instruction: Salary of Principal	Salaries of Clerks.	Postage.	Salaries of Teachers	Text Books.	Supplementary and Reference Books.	Commercial Supplies and Equipment.	Laboratory Supplies.	Printing	Miscellaneous Educational Supplies	Incidentals	Total for Instruction.	Number of Pupil Hours	Cost per Pupil Hour of Instruction.	Operation of Plant: Salary of Janitor	Promotion of Health: Salaries of School Physicians	Nurses' Salaries	Supplies, School Physicians and Nurses	Total for Promotion of Health.	Total.	Direct Income.	Net Total.*	Number of Sessions.	Average Attendance	Cost per Pupil, Average Attendance.*	Number of Pupil Hours.	Cost per Pupil Hour.*	School.
Summer Review High	$312 00	...	$2 00	$4,700 50	$78 45	...	$35 30	.	$5 41	$154 35	.	$5,377 01	81,610	$0 063	$2 41	$10 00			$10 00	$5,647 28	.	$5,647 28*	40	529	$10 68*	84,040	$0 066*	Summer Review High.

SUMMER REVIEW ELEMENTARY SCHOOLS.*

[For Total and Net Costs, See Sheet No. 1.]

Schools.	Expenses of Instruction: Salaries of Principals	Salaries of Clerks	Postage	Telephone	Salaries of Teachers.	Text Books	Supplementary and Reference Books.	Commercial Supplies and Equipment	Miscellaneous Educational Supplies	Incidentals	Total for Instruction.	Number of Pupil Hours	Cost per Pupil Hour of Instruction.	Operation of Plant: Salaries of Janitors	Promotion of Health: Salaries of School Physicians	Nurses' Salaries	Supplies, School Physicians and Nurses	Total for Promotion of Health.	Total.	Direct Income.	Net Total.*	Number of Sessions	Average Attendance.	Cost per Pupil, Average Attendance.*	Number of Pupil Hours.	Cost per Pupil Hour.*	Schools.
Bigelow	$240 00	.....	$3 38	$1 55	$1,817 00	.....	.....	.....	$116 41	.	$2,178 37	49,800	$0 013	$303 22	$58 31	.	.	$58 31	$2,540 03	..	$2,540 03*	10	415	$6 12*	49,800	$0 051*	Bigelow.
Charlestown	240 00	.....	.....	.....	1,173 00	.....	.....	.....	36 13	.....	1,449 13	34,800	041	160 72	29 17	.	.	29 17	1,639 02	.	1,639 02*	10	299	5 65*	34,800	047*	Charlestown.
City	240 00	.....	.....	.....	2,115 00	.....	.....	.....	30 60	$3 50	2,389 10	61,680	038	231 01	29 16	.	.	29 16	2,649 30	.	2,649 30*	10	514	5 15*	61,680	042*	City.
Dorchester	240 00	.....	6 00	2 60	2,400 00	.....	.....	.....	69 05	.	2,717 65	69,240	039	197 50	40 00	.	.	10 00	2,935 15	.	2,935 15*	10	577	5 12*	69,240	042*	Dorchester.
East Boston	240 00	.....	2 55	2,151 00	.....	.....	.....	.....	109 44	.	2,502 99	67,200	037	187 20	29 16	.	.	29 16	2,719 35	.	2,719 35*	10	560	4 86*	67,200	040*	East Boston.
Hugh O'Brien	234 00	.....	3 50	1 50	1,377 00	.....	.....	$1 35	35 16	06	1,652 80	39,120	042	168 20	40 00	.	.	10 00	1,861 09	.	1,861 09*	10	326	5 71*	39,120	047*	Hugh O'Brien
Hyde Park	240 00	.....	.....	.....	951 00	.....	.....	.....	28 72	.	1,219 72	27,120	044	117 42	40 00	.	.	40 00	1,107 14*	.	1,107 14*	10	226	6 23*	27,120	051*	Hyde Park.
Lewis	240 00	.....	1 95	1 55	2,151 00	.....	.....	.....	80 62	.	2,184 12	62,520	039	181 60	40 00	.	.	40 00	2,705 72	.	2,705 72*	10	521	5 10*	62,520	043*	Lewis.
West End	240 00	.....	1 20	3 54	1,779 00	.....	.....	.....	83 12	.	2,106 86	54,120	038	168 72	29 17	.	.	29 17	2,304 75*	.	2,304 75*	10	451	5 11*	54,120	042*	West End.
Totals	$2,151 00	..	$16 03	$13 29	$15,914 00	...	..	$1 35	$798 60	$4 56	$18,799 83	465,600	$0 040	$1,745 72	$335 00			$335 00	$20,781 55		$20,781 55*		3,889	$5 36*	465,600	$0 044*	Totals.

*EXCLUSIVE OF COSTS OF BUILDING, DEPRECIATION, REPAIRS, INTEREST AND SINKING FUND CHARGES.

SHEET NO. 4.

EVENING SCHOOLS.

COST EXCLUSIVE OF ADMINISTRATION, SUPERVISION AND GENERAL CHARGES, AND WITH DIRECT INCOME DEDUCTED.

(For Total and Net Costs, see Sheet No. 1.)

COST OF EVENING SCHOOLS, EXCLUSIVE OF ADMINISTRATION, SUPERVISION AND GENERAL CHARGES, AND WITH DIRECT INCOME DEDUCTED.*

EVENING HIGH SCHOOLS.*

[For Total and Net Costs, See Sheet No. 1.]

Schools.	Expenses of Instruction.																Operation of Plant.						Total.	Direct Income.	Net Total.*	Number of Sessions.	Average Attendance.	Cost per Pupil, Average Attendance.*	Number of Pupil Hours.	Cost per Pupil Hour.*	Schools.
	Salaries of Principals.	Salaries of Clerks.	Postage.	Salaries of Teachers.	Text Books.	Supplementary and Reference Books.	Drawing Supplies and Equipment.	Manual Training Supplies and Equipment.	Laboratory Supplies and Equipment.	Musical Instruments and Supplies.	Printing.	Commercial Supplies and Equipment.	Miscellaneous Educational Supplies.	Incidentals.	Advertising.	Total for Instruction.	Number of Pupil Hours.	Cost per Pupil Hour of Instruction.	Salaries of Janitors.	Fuel.	Light.	Power.	Janitors' Supplies.	Total for Operation of Plant.								
Brighton Commercial High	$532 00	$222 00	$12 87	$1,733 00	$175 91	$10 56					$49 63	$89 55	$18 64		$4 25	$2,868 41	13,302	$0 215	$478 40	$196 50	$84 70	$57 75		$817 35	$3,685 76		$3,685 76*	77	86	$42 86*	13,302	$0 277*	Brighton Commercial High.
Central High	539 00	275 00	13 00	7,102 50	283 05		$89 15	$8 47	$78 60		86 86	190 81	170 11		10 00	8,936 55	28,445	314	818 15	583 50	308 00	77 00		1,786 65	10,723 20		10,723 20*	77	369	29 06*	28,445	376*	Central High.
Charlestown Commercial High	539 00	243 00	20 80	2,768 00							56 71	41 62	85 60			3,757 76	26,334	142	550 76	295 75	123 20			969 71	4,727 47		4,727 47*	77	171	27 65*	26,334	179*	Charlestown Commercial High.
Dorchester Commercial High	539 00	267 50	10 68	5,990 25							100 63	79 52	92 54		8 75	7,088 87	54,102	131	773 79	582 50	246 40			1,602 69	8,691 56		8,691 56*	77	351	24 76*	54,102	160*	Dorchester Commercial High.
East Boston Commercial High	539 00	210 00	15 55	2,797 50	90						52 51	43 56	51 54		1 50	3,742 09	26,860	139	560 38	391 00	130 90			1,082 48	4,824 57		4,824 57*	77	174	27 73*	26,860	179*	East Boston Commercial High.
Girls' High	539 00	279 00	9 50	4,608 50	90 80	43 52					81 21	77 53	155 52			5,884 58	44,470	132	733 96	421 00	215 60	61 60		1,432 16	7,316 74		7,316 74*	77	289	25 32*	44,470	164*	Girls' High.
Hyde Park Commercial High	78 00	64 00	4 91	1,444 00	70 20	22 40					21 80	5 36	18 89		5 50	1,735 06	9,240	187	368 78	192 50	61 60	38 50		661 38	2,396 44		2,396 44*	77	60	39 94*	9,240	259*	Hyde Park Commercial High.
Roxbury Commercial High	539 00	275 50	21 68	6,954 50	273 35						125 75	98 21	87 31			8,375 33	66,898	125	805 66	387 00	269 50	38 50		1,500 66	9,875 99		9,875 99*	77	434	22 76*	66,898	147*	Roxbury Commercial High.
South Boston Commercial High	539 00	257 00	32 75	4,115 50	155 85	35 84					103 38	43 51	79 44		10 00	5,372 27	50,976	105	670 27	391 00	184 80			1,246 07	6,618 34		6,618 34*	77	331	19 99*	50,976	129*	South Boston Commercial High.
Totals	$4,383 00	$2,123 00	$141 74	$37,623 75	$1,050 06	$112 32	$89 15	$8 47	$78 60		$678 51	$672 70	$759 62		$40 00	$47,760 02	320,627	$0 148	$5,760 25	$3,440 75	$1,024 70	$273 35		$11,099 15	$58,860 07		$58,860 07*		2,265	$25 99*	320,627	$0 183*	Totals.

EVENING ELEMENTARY SCHOOLS.*

[For Total and Net Costs, See Sheet No. 1.]

Schools.	Expenses of Instruction.																	Operation of Plant.						Total.	Direct Income.	Net Total.*	Number of Sessions.	Average Attendance.	Cost per Pupil, Average Attendance.*	Number of Pupil Hours.	Cost per Pupil Hour.*	Schools.
	Salaries of Principals.	Salaries of Clerks.	Postage.	Salaries of Teachers.	Text Books.	Supplementary and Reference Books.	Drawing Supplies and Equipment.	Manual Training Supplies and Equipment.	Cookery Supplies and Equipment.	Sewing Supplies and Equipment.	Musical Instruments and Supplies.	Printing.	Miscellaneous Educational Supplies.	Incidentals.	Advertising.	Total for Instruction.	Number of Pupil Hours.	Cost per Pupil Hour of Instruction.	Salaries of Janitors.	Fuel.	Light.	Power.	Janitors' Supplies.	Total for Operation of Plant.								
Bigelow	$455 50	$154 00	$3 00	$2,574 50						$1 13		$16 42	$43 41			$3,247 96	34,770	$0 093	$659 35	$276 41	$169 40			$1,105 16	$4,353 12		$4,353 12*	77	225	$19 35*	34,770	$0 125*	Bigelow.
Bowdoin	455 50	132 00	6 85	2,169 00	$25 20					42 39		17 29	54 05		$10 00	2,912 28	25,340	114	697 03	194 50	146 30			1,037 89	3,950 17		3,950 17*	77	164	24 09*	25,340	155*	Bowdoin.
Charles Sumner	449 50	150 00	4 58	2,591 00	54 30				$21 00	35 00			7 42		7 00	3,319 80	23,256	142	799 88	588 00	110 10			1,497 98	4,817 78		4,817 78*	77	151	31 91*	23,256	207*	Charles Sumner.
Comins	455 50	150 00	6 94	5,142 00					53 64	122 69		17 50	105 02		3 50	6,050 79	55,440	109	982 49	585 50	272 30	$19 25		1,859 54	7,916 33		7,916 33*	77	360	21 99*	55,440	142*	Comins.
Dearborn	210 00	70 00	5 00	945 00	$7 30	$13 50				35 00			63 09		6 00	1,434 89	13,502	106	293 60	175 00	66 50			535 10	1,969 99		1,969 99*	35	193	10 21*	13,502	145*	Dearborn.
Eliot	455 50	98 00	10 00	4,163 00	118 00							21 80	119 49			4,985 88	53,468	093	910 90	315 00	280 50			1,506 40	6,492 28		6,492 28*	77	347	18 71*	53,468	121*	Eliot.
Franklin	455 50	170 00	6 00	4,945 50	49 56	5 94						21 81	110 67			5,773 98	75,812	076	776 64	409 50	264 60			1,450 74	7,224 72		7,224 72*	77	492	14 68*	75,812	095*	Franklin.
George Putnam	455 50	148 00	4 42	2,424 00	85 45					112 62			21 37		10 00	3,261 36	25,576	127	715 56	336 50	115 50			1,197 56	4,458 92		4,458 92*	77	166	26 86*	25,576	174*	George Putnam.
Hyde Park	461 00	64 00		1,460 00									40			1,985 40	14,348	138	176 47	128 59	100 10	11 55		416 71	2,402 11		2,402 11*	77	93	25 83*	14,348	167*	Hyde Park.
Phillips Brooks	455 50	154 00	11 73	4,464 00	59 20					3 20		18 34	44 19			5,213 16	50,786	102	1,195 32	520 59	300 30	85 47		2,101 68	7,314 84		7,314 84*	77	330	22 17*	50,786	144*	Phillips Brooks.
Quincy	210 00	70 00	2 50	936 00	67 50							89	53 62		7 00	1,347 51	13,278	101	211 02	118 90	70 00			399 92	1,747 43		1,747 43*	35	190	9 20*	13,278	131*	Quincy.
Roger Wolcott	455 50	142 00	8 20	1,827 00								18 18	38 57		6 50	2,495 95	22,166	112	595 55	256 41	130 90			982 86	3,478 81		3,478 81*	77	144	24 16*	22,166	156*	Roger Wolcott.
Theodore Lyman	455 50	146 00	5 00	4,019 50						78 95			60 56		8 25	4,773 76	50,994	093	920 02	454 50	251 90			1,626 42	6,400 18		6,400 18*	77	331	19 34*	50,994	125*	Theodore Lyman.
Washington	455 50	154 00	9 35	3,999 00								18 95	106 56		9 00	4,752 36	49,058	096	839 69	489 25	223 30	85 47		1,637 71	6,390 07		6,390 07*	77	319	20 03*	49,058	130*	Washington.
Totals	$5,885 50	$1,802 00	$86 57	$41,659 50	$546 51	$19 44			$74 64	$430 98		$151 27	$837 42		$67 25	$51,501 08	507,794	$0 101	$9,803 58	$4,848 65	$2,501 70	$201 74		$17,355 67	$68,916 75		$68,916 75*		3,505	$19 66*	507,794	$0 135*	Totals.

EVENING SCHOOL EXTENSION.*

[For Total and Net Costs, See Sheet No. 1.]

Schools.	Expenses of Instruction.					Operation of Plant.						Total.	Direct Income.	Net Total.*	Number of Sessions.	Average Attendance.	Cost per Pupil, Average Attendance.*	Number of Pupil Hours.	Cost per Pupil Hour.*	Schools
	Salaries of Principals.	Salaries of Teachers.	Total for Instruction.	Number of Pupil Hours.	Cost per Pupil Hour of Instruction.	Salaries of Janitors.	Fuel.	Light.	Power.	Janitors' Supplies.	Total for Operation of Plant.									
Bigelow	$90 00	$180 00	$270 00	1,934	$0 139	$98 30	$18 75	$12 00			$129 05	$399 05		$399 05*	15	64	$6 24*	1,934	$0 206*	Bigelow.
Bowdoin	90 00	460 50	550 50	3,998	137	189 90	37 50	24 00			251 40	801 90		801 90*	15	133	6 03*	3,998	200*	Bowdoin.
Comins	66 00	155 00	221 00	1,928	114	63 00	18 75	12 00			93 75	314 75		314 75*	15	65	4 84*	1,928	163*	Comins.
Eliot	90 00	409 00	499 00	4,132	120	120 48	18 75	27 00			166 23	665 23*		665 23*	15	138	4 82*	4,132	160*	Eliot.
Franklin	90 00	429 00	519 00	5,362	096	85 50	18 75	27 00			131 25	650 25		650 25*	15	178	3 65*	5,362	121*	Franklin.
Phillips Brooks	90 00	442 50	532 50	4,692	113	200 80	37 50	30 00			268 30	800 80		800 80*	15	150	5 13*	4,692	170*	Phillips Brooks
Theodore Lyman	90 00	557 50	647 50	4,758	136	185 70	37 50	36 00			259 20	906 70		906 70*	15	158	5 74*	4,758	190*	Theodore Lyman.
Totals	$606 00	$2,633 50	$3,239 50	26,804	$0 120	$943 68	$187 50	$168 00			$1,299 18	$4,538 68		$4,538 68*		892	$5 09*	26,804	$0 169*	Totals.

BOSTON TRADE SCHOOL, EVENING CLASSES.*

[For Total and Net Costs, See Sheet No. 1.]

School.	Expenses of Instruction.													Operation of Plant.						Total.	Direct Income.†	Net Total.*	Number of Sessions.	Average Attendance.	Cost per Pupil, Average Attendance.*	Number of Pupil Hours.	Cost per Pupil Hour.*	School.
	Salary of Principal.	Salaries of Clerks	Postage.	Salaries of Teachers	Telephone.	Manual Training Supplies and Equipment.	Drawing Supplies.	Printing.	Miscellaneous Educational Supplies.	Office Supplies.	Carfares and Incidentals.	Total for Instruction.	Number of Pupil Hours.	Cost per Pupil Hour of Instruction.	Salaries of Janitors.	Fuel.	Light.	Power.	Janitors' Supplies.	Total for Operation of Plant.									
Boston Trade School, Evening Classes	$109 00	$513 06	$23 15	$9,030 75	$2 60	$1,641 49	$30 40	$8 20	$39 66		$1 80	$12,390 11	54,830	$0 225	$1,483 62	$1,167 00	$99 30			$2,719 92	$15,110 03	$6,693 84†	$8,416 19*	77	355	$23 71*	54,830	$0 153*	Boston Trade School, Evening Classes.

† Includes half the net cost of maintenance as aid from the Commonwealth for the period September 1, 1919, to August 31, 1920 ($5,079.35) and Smith-Hughes Fund allotment ($740.45).

AFTERNOON PRACTICAL ARTS CLASSES* (INCLUDING SUMMER PRACTICAL ARTS CLASSES).

[For Total and Net Costs, See Sheet No. 1.]

	Salaries of Teachers	Sewing Supplies.	Total.	Direct Income.†	Net Total.*	Average Attendance.	Cost per Pupil, Average Attendance.*	Number of Pupil Hours.	Cost per Pupil Hour.*	
Afternoon Practical Arts Classes	$1,452 00		$1,452 00	$430 65†	$1,021 35*	316	$3 23*	13,822	$0 073*	Afternoon Practical Arts Classes.

† Includes half the net cost of maintenance as aid from the Commonwealth for the period September 1, 1919, to August 31, 1920 ($430 65).

* EXCLUSIVE OF COSTS OF BUILDING, DEPRECIATION, REPAIRS, INTEREST AND SINKING FUND CHARGES.

SHEET NO. 5.

SCHOOL CENTERS.— USE OF SCHOOL ACCOMMODATIONS.

COST EXCLUSIVE OF ADMINISTRATION, SUPERVISION AND GENERAL CHARGES.

(For Total and Net Costs, see Sheet No. 1.)

COST OF ACTIVITIES, EXTENDED USE OF PUBLIC SCHOOLS, EXCLUSIVE OF ADMINISTRATION, SUPERVISION AND GENERAL CHARGES.*

SCHOOL CENTERS.*

[For Total and Net Costs, See Sheet No. 1.]

	Salaries of Managers, Leaders, etc.	Services of Speakers at Forum Meetings, etc.	Services of Motion Bureau, etc.	Illustrated Lectures and Song Slides.	Motion Picture Machines, Repairs, Film Rental, etc.	Musical Instruments, Music Supplies and Repairs.	Printing and Advertising.	Postage.	Telephone.	Incidentals.	Salaries of Janitors.	Fuel.	Light.	Total.	Direct Income.	Net Total.*	Number of Sessions.	Average Attendance.	Per Capita Cost, Average Attendance.*	
Charlestown	$3,269 13	$70 00	$524 31	.....	$84 95	.....	$10 25	.....	.....	$279 20	$1,125 61	$385 00	$169 27	$5,917 72	$628 63	$5,289 09*	42	943	$5 61*	Charlestown.
Dorchester	3,245 50	70 00	503 82	.....	56 70	.....	15 70	.....	.....	240 25	1,065 17	345 00	303 10	5,845 24	1,012 51	4,832 73*	51	1,339	3 61*	Dorchester.
East Boston	4,464 75	122 50	590 50	.....	10 12	.....	4 62	.....	.....	325 22	1,078 84	350 00	273 32	7,219 87	734 55	6,485 32*	48	1,530	4 24*	East Boston.
English High	828 50	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,077 51	210 00	260 48	2,376 49	58 83	2,317 66*	33	1,646	1 41*	English High.
Michael Angelo	2,853 00	75 00	43 25	.....	119 63	.....	34 33	.....	.....	225 00	808 29	300 00	300 74	4,759 24	616 25	4,142 99*	82	426	9 73*	Michael Angelo.
Roxbury	4,486 62	130 00	535 00	.....	6 00	.....	39 54	.....	Cr. $13 02	607 44	1,820 16	470 00	533 97	8,615 71	1,535 45	7,080 26*	109	640	11 06*	Roxbury.
Sarah Greenwood	2,324 00	168 75	711 50	.....	185 08	.....	253 95	.....	.....	17 00	472 30	365 00	143 60	4,641 18	162 50	4,478 68*	70	626	7 15*	Sarah Greenwood.
South Boston	1,989 25	56 00	558 00	.....	.....	.....	17 00	.....	.....	200 00	633 80	240 00	129 16	3,823 21	189 05	3,634 16*	26	1,257	2 89*	South Boston.
Washington	360 50	.....	326 00	.....	10 50	.....	16 25	.....	.....	.....	293 35	85 00	26 59	1,118 19	.....	1,118 19*	18	453	2 47*	Washington.
William Blackstone	1,716 75	.....	64 12	.....	77 86	.....	.....	.....	.....	200 00	444 29	225 00	116 96	2,844 98	117 18	2,727 80*	20	1,706	1 60*	William Blackstone.
Totals	$25,538 00	$692 25	$3,856 50	.....	$550 84	.....	$391 64	.....	Cr. $13 02	$2,094 11	$8,819 32	$2,975 00	$2,257 19	$47,161 83	$5,054 95	$42,106 88*	.....	10,566	$3 99*	Totals.

USE OF SCHOOL ACCOMMODATIONS FOR MUNICIPAL CONCERTS, PARENTS' AND TEACHERS' MEETINGS, ALUMNI MEETINGS, ETC.*

[For Total and Net Costs, See Sheet No. 1.]

	Salaries of Attendants, Doormen, etc.	Salaries of Janitors.	Fuel.	Light.	Incidentals.	Total.	Direct Income.	Net Total.*	Total Attendance.	Per Capita Cost.*	
Use of School Accommodations	$1,050 50	$6,254 39	$1,802 50	$1,032 61	$17 50	$10,157 50	$4,944 65	$5,212 85*	265,677	$0 019*	Use of School Accommodations.

*EXCLUSIVE OF COSTS OF BUILDING, DEPRECIATION, REPAIRS, INTEREST AND SINKING FUND CHARGES.

SHEET NO. 6.

PARK PLAYGROUNDS.— SCHOOLYARD PLAYGROUNDS.

COST EXCLUSIVE OF ADMINISTRATION, SUPERVISION AND GENERAL CHARGES.

(For Total and Net Costs, see Sheet No. 1.)

COST OF PLAYGROUNDS, EXCLUSIVE OF ADMINISTRATION, SUPERVISION AND GENERAL CHARGES.*

PARK PLAYGROUNDS.*

[For Total and Net Costs, See Sheet No. 1.]

	Teachers' Salaries.	Janitors' Salaries.	Apparatus.	Labor and Teaming on Apparatus, etc.	Supplies for Athletics and Games.	Supplies for Quiet Play.	Printing and Incidentals.	Total.*	Number of Sessions.	Average Attendance.	Cost per Pupil.*	Cost per Pupil per Session.*	
Allston	$101 55	.....	$19 12	$20 22	$21 66	.....	$1 10	$163 65*	32	103	$1 59*	$0 049*	Allston.
Ashmont	823 43	$22 12	19 12	23 82	62 55	$1 03	1 10	953 17*	258	132	7 22*	027*	Ashmont.
Billings Field	629 80	30 90	19 12	23 82	74 37	6 64	1 10	785 75*	199	139	5 65*	028*	Billings Field.
Boston Common	631 05	.....	28 30	32 72	134 73	10 89	1 45	839 14*	219	66	12 71*	058*	Boston Common.
Charlesbank (Boys)	670 91	.....	32 40	43 35	36 89	13 93	1 23	798 71*	169	191	4 18*	024*	Charlesbank (Boys).
Charlesbank (Girls)	1,090 68	.....	32 39	43 34	36 88	13 93	1 22	1,218 44*	228	244	4 99*	021*	Charlesbank (Girls).
Charlestown	159 06	.....	19 13	20 22	33 50	.....	1 10	233 01*	65	27	8 63*	132*	Charlestown.
Charlestown Heights	846 13	18 80	19 13	121 22	.....	8 00	6 18	1,019 46*	219	227	4 49*	02 *	Charlestown Heights.
Christopher Gibson (John A. Doherty)	932 99	25 50	19 13	20 21	95 34	44	5 12	1,098 73*	274	460	2 39*	008*	Christopher Gibson (John A. Doherty).
Christopher J. Lee	683 66	.....	19 13	20 21	87 08	2 85	1 11	814 04*	220	154	5 29*	024*	Christopher J. Lee.
Commonwealth	166 81	.....	19 13	20 22	48 95	.....	1 10	256 21*	63	73	3 51*	055*	Commonwealth.
Cottage Street	957 68	.....	19 13	20 21	105 79	3 90	1 11	1,107 82*	293	235	4 71*	016*	Cottage Street.
Dorchester Park	94 81	.....	19 13	20 21	22 91	.....	1 11	158 17*	32	55	2 87*	089*	Dorchester Park.
Eagle Hill	581 49	35 48	19 13	20 21	81 38	10 67	1 34	749 70*	132	143	5 24*	039*	Eagle Hill.
Fallon Field	633 21	34 20	19 13	20 21	54 88	3 22	1 11	765 96*	205	119	6 44*	031*	Fallon Field.
Fellows Street	814 78	.....	19 13	20 71	51 72	10 91	1 11	918 36*	223	152	6 04*	027*	Fellows Street.
Fenway	595 98	.....	19 13	20 21	47 11	.....	1 11	683 54*	185	54	12 66*	068*	Fenway.
Forest Hills	660 56	5 42	19 13	20 21	51 86	.....	1 11	758 29*	211	106	7 15*	033*	Forest Hills.
Franklin Field	1,065 31	16 00	19 13	20 21	141 61	7 23	11 11	1,280 60*	341	152	8 43*	024*	Franklin Field.
Franklin Park	479 56	.....	19 13	20 21	180 05	.....	1 11	700 06*	201	77	9 09*	045*	Franklin Park.
Franklin Square	488 31	18 00	19 13	20 21	17 04	2 11	1 11	565 91*	144	118	4 80*	033*	Franklin Square.
Frederick D. Emmons	865 38	18 00	19 13	20 21	83 96	12 52	3 11	1,022 31*	234	212	4 82*	02 *	Frederick D. Emmons.
Frog Pond	473 34	.....	26 71	20 59	5 44	4 21	1 11	540 40*	118	358	1 51*	012*	Frog Pond.
Henry Grew Field	101 55	.....	19 13	20 21	19 45	.....	1 11	161 45*	34	41	3 94*	115*	Henry Grew Field.
Jefferson Lot	97 05	.....	19 13	20 21	.....	.....	1 11	137 50*	33	61	2 25*	068*	Jefferson Lot.
John W. Murphy, Jr	664 28	.....	19 12	20 22	65 03	2 45	1 10	772 20*	216	221	3 49*	016*	John W. Murphy, Jr.
John Winthrop	920 03	35 32	19 13	20 21	89 15	7 01	1 11	1,091 96*	249	179	6 10*	024*	John Winthrop.
Marcella Street	954 93	.....	19 13	20 21	86 09	2 11	5 66	1,088 13*	323	171	6 36*	019*	Marcella Street.
Matthew J. Sweeney Park	810 97	.....	19 13	22 21	25 91	26 60	1 11	905 93*	227	228	3 97*	017*	Matthew J. Sweeney Park.
Metropolitan	92 55	.....	19 13	20 21	16 00	.....	1 11	149 00*	54	20	7 45*	137*	Metropolitan.
Mission Hill	833 19	18 00	19 13	20 21	59 19	2 11	3 11	954 94*	234	214	4 46*	019*	Mission Hill.
Mozart Street	747 33	33 00	19 13	20 21	64 64	10 35	2 97	897 63*	203	197	4 56*	022*	Mozart Street.
Mystic	744 92	21 64	19 13	20 21	32 22	4 11	1 11	843 34*	230	161	5 24*	022*	Mystic.
Neponset	531 90	19 20	19 13	20 21	44 52	3 51	1 66	640 13*	143	198	3 23*	022*	Neponset.
Norfolk Street	772 05	1 50	19 13	20 21	66 17	4 90	6 11	890 07*	220	153	5 82*	026*	Norfolk Street.
North End Park	173 54	.....	19 13	20 21	43 66	.....	1 34	257 88*	36	228	1 13*	031*	North End Park.
Orchard Park	725 67	149 85	19 13	20 21	20 69	2 74	1 11	939 40*	203	211	4 45*	021*	Orchard Park.
Orient Heights	103 79	.....	19 13	20 21	30 70	.....	1 11	174 94*	35	178	98*	028*	Orient Heights.
Parkinson	103 79	.....	19 13	20 21	27 91	.....	1 11	172 15*	35	73	2 36*	067*	Parkinson.
Portsmouth Street	281 89	12 00	19 13	20 21	20 37	.....	1 11	354 71*	124	135	2 63*	021*	Portsmouth Street.
Randolph Street	1,029 27	.....	19 13	44 71	135 27	11 80	1 11	1,241 29*	332	120	10 34*	031*	Randolph Street.
Reservoir	88 04	.....	19 13	20 21	22 91	.....	1 11	151 40*	28	75	2 02*	072*	Reservoir.
Ripley	716 32	26 84	102 13	20 21	19 94	5 18	2 08	892 70*	198	128	6 97*	035*	Ripley.
Rogers Park	684 34	.....	19 13	20 21	67 45	2 79	1 11	795 03*	195	150	5 30*	027*	Rogers Park.
Ronan Park	747 83	40 80	19 13	20 21	99 17	1 89	1 11	930 14*	167	160	5 81*	034*	Ronan Park.
Saratoga	677 63	37 29	19 13	20 21	25 88	2 72	3 11	785 97*	222	127	6 19*	027*	Saratoga.
Savin Hill	94 79	.....	19 13	20 21	35 18	.....	1 11	170 42*	26	75	2 27*	087*	Savin Hill.
Strandway	875 74	20 58	19 13	20 21	94 56	2 11	1 11	1,033 44*	259	148	6 98*	026*	Strandway.
Tyler Street	648 38	112 25	19 13	20 21	9 24	3 93	1 11	814 25*	200	92	8 85*	044*	Tyler Street.
Vincent Cutillo	1,381 13	.....	19 13	20 21	27 40	5 26	1 61	1,454 74*	229	322	4 52*	019*	Vincent Cutillo.
Washington Park	717 59	139 90	20 91	32 71	24 74	3 51	1 11	940 47*	188	246	3 82*	02 *	Washington Park.
West Third Street	704 58	35 02	19 51	23 96	27 26	4 06	1 11	815 50*	195	139	5 87*	03 *	West Third Street.
William E. Carter	907 58	44 06	19 13	20 21	104 55	1 84	1 11	1,098 48*	275	123	8 93*	032*	William E. Carter.
William Eustis Park	866 18	30 00	19 13	20 71	74 78	4 00	1 11	1,015 91*	247	182	5 58*	022*	William Eustis Park.
William Francis Smith	694 59	24 00	19 13	20 21	51 90	3 24	1 11	814 18*	207	171	4 76*	023*	William Francis Smith.
Wood Island	629 15	.....	19 13	20 21	94 19	4 96	3 11	770 75*	169	128	6 02*	035*	Wood Island.
Totals	$34,569 05	$1,025 67	$1,199 68	$1,351 94	$3,101 82	$235 66	$103 64	$41,587 46*	.....	8,652	$4 81*	$0 024*	

*EXCLUSIVE OF COSTS OF BUILDING, DEPRECIATION, REPAIRS, INTEREST AND SINKING FUND CHARGES.

SCHOOLYARD PLAYGROUNDS.*

[For Total and Net Costs, See Sheet No. 1.]

	Teachers' Salaries.	Janitors' Salaries.	Apparatus.	Labor and Teaming on Apparatus, etc.	Supplies for Athletics and Games.	Supplies for Quiet Play.	Printing and Incidentals.	Total.*	Number of Sessions.	Average Attendance.	Cost per Pupil.*	Cost per Pupil per Session.*	
Andrews	$309 76	$120 00	$27 63	$20 71	$12 05	$8 02	$1 36	$499 53*	86	250	$2 00*	$0 023*	Andrews.
Choate Burnham	312 96	108 00	30 37	30 21	14 52	5 18	3 11	504 35*	83	223	2 26*	027*	Choate Burnham.
Comins	303 01	130 20	19 13	20 21	21 11	5 90	1 11	500 67*	44	112	4 47*	101*	Comins.
Cyrus Alger	331 61	118 50	28 13	20 21	17 32	5 99	1 11	522 87*	88	167	3 13*	035*	Cyrus Alger.
Damon	271 01	106 50	19 13	20 21	15 37	3 36	1 11	436 69*	75	136	3 21*	042*	Damon.
Dudley	324 51	122 64	19 83	20 21	7 98	3 65	1 11	499 93*	87	117	4 27*	049*	Dudley.
Edmund P. Tileston	291 66	102 22	19 13	20 21	16 60	7 67	1 11	458 60*	73	138	3 32*	045*	Edmund P. Tileston.
Elihu Greenwood	290 96	106 50	19 13	58 46	7 12	6 81	1 11	490 09*	81	109	4 50*	055*	Elihu Greenwood.
Ellis Mendell	333 21	130 50	19 13	20 21	9 95	10 68	11 56	535 24*	87	144	3 72*	042*	Ellis Mendell.
Emerson	323 77	137 58	22 74	33 71	24 57	16 37	1 11	559 85*	91	281	1 99*	021*	Emerson.
Fairmount	291 62	117 96	26 95	26 71	17 01	12 65	1 51	494 41*	79	109	4 54*	057*	Fairmount.
Farragut	306 02	114 00	19 13	20 21	10 80	7 41	1 11	478 68*	80	114	4 20*	052*	Farragut.
Francis Parkman	286 87	110 80	19 13	20 21	12 75	4 56	1 11	455 43*	78	87	5 23*	067*	Francis Parkman.
Frothingham	329 12	149 10	19 13	20 21	11 03	1 40	1 11	531 10*	92	154	3 45*	037*	Frothingham.
Hancock	357 62	129 42	19 13	20 21	24 46	7 23	1 11	559 18*	81	174	3 21*	039*	Hancock.
Henry Grew	293 62	104 80	19 13	58 46	9 62	6 61	1 11	493 35*	84	95	5 19*	061*	Henry Grew.
John D. Philbrick	270 92	110 14	19 13	20 21	7 75	4 33	1 11	433 59*	71	91	4 76*	067*	John D. Philbrick.
John J. Williams	304 67	106 50	19 13	20 71	9 00	6 77	1 11	467 89*	126	84	5 57*	044*	John J. Williams.
Lafayette	302 27	114 00	29 58	38 21	10 47	9 98	1 56	506 07*	79	82	6 17*	078*	Lafayette.
Lucretia Crocker	322 57	121 50	19 13	69 41	18 66	11 30	1 11	563 68*	80	146	3 86*	048*	Lucretia Crocker.
Nathan Hale	310 67	108 50	24 28	40 21	21 72	5 16	1 11	511 65*	80	108	4 74*	059*	Nathan Hale.
Phillips Brooks	330 37	120 00	26 78	33 71	20 70	15 79	1 33	548 68*	87	254	2 16*	024*	Phillips Brooks.
Prescott	442 72	139 74	20 43	30 21	21 75	6 30	1 11	662 26*	91	263	2 52*	027*	Prescott.
Robert Swan	321 77	133 50	21 59	30 21	13 95	2 50	1 11	524 63*	50	123	4 27*	085*	Robert Shaw.
Samuel Adams	242 72	79 70	19 13	20 21	9 70	1 13	1 11	373 70*	67	143	2 61*	039*	Samuel Adams.
Stoughton	307 47	106 50	19 38	30 21	16 76	4 20	1 11	485 63*	79	120	4 05*	051*	Stoughton.
Theodore Lyman	313 07	131 76	19 13	20 21	17 15	3 96	4 36	509 64*	88	226	2 26*	025*	Theodore Lyman.
Wait	567 56	223 50	19 13	20 21	10 99	1 62	1 11	844 12*	144	314	2 69*	018*	Wait.
Washington	429 87	143 54	52 13	68 91	14 74	2 10	1 11	712 40*	88	339	2 10*	023*	Washington.
Wendell Phillips	682 49	291 30	32 38	42 71	17 65	3 67	1 11	1,071 31*	186	194	5 52*	029*	Wendell Phillips.
William Blackstone	344 67	117 00	19 13	20 71	17 47	9 44	1 11	529 53*	91	134	3 95*	043*	William Blackstone
William E. Russell	347 82	109 47	74 13	377 21	23 04	5 79	1 11	917 97*	91	121	7 59*	083*	William E. Russell.
William Eustis	311 72	118 50	19 13	20 21	8 90	1 73	1 11	481 30*	87	171	2 81*	032*	William Eustis.
William Wirt Warren	180 12	63 00	19 13	21 21	16 23	14 11	1 11	314 91*	48	168	1 87*	039*	William Wirt Warren.
Totals	$11,270 80	$4,246 87	$819 80	$1,355 04	$508 89	$222 77	$54 76	$18,478 93*	.....	5,491	$3 37*	$0 037*	

*EXCLUSIVE OF COSTS OF BUILDING, DEPRECIATION, REPAIRS, INTEREST AND SINKING FUND CHARGES.

A GUIDE TO THE CHOICE OF A SECONDARY SCHOOL

SCHOOL DOCUMENT NO. 2, 1922

BOSTON LATIN, HIGH AND TRADE SCHOOLS

LATIN SCHOOLS

Public Latin School (Boys), Avenue Louis Pasteur, Fenway

Girls' Latin School, Huntington avenue, near Longwood avenue, Fenway

HIGH SCHOOLS

The Central Schools

Boys

English High School, Montgomery street, South End

High School of Commerce, Avenue Louis Pasteur, Fenway

Mechanic Arts High School, Belvidere and Dalton streets, Back Bay

Girls

Girls' High School, West Newton street, between Tremont street and Shawmut avenue, South End

High School of Practical Arts, Winthrop and Greenville streets, Roxbury

Roxbury High School, Warren and Montrose streets, Roxbury

The Suburban Schools

Boys and Girls

Brighton High School, Cambridge and Warren streets, Brighton

Charlestown High School, Monument square, Charlestown

Dorchester High School, Talbot avenue and Washington street, Dorchester

East Boston High School, Marion street, between Princeton and Saratoga streets, East Boston

Hyde Park High School, Harvard avenue and Everett street, Hyde Park

South Boston High School, Thomas park and G street, South Boston

West Roxbury High School, Elm street, opposite Greenough avenue, Jamaica Plain

TRADE SCHOOLS

Boston Trade School (Boys), Parker street, near Ruggles street, Roxbury

Trade School for Girls, 620 Massachusetts avenue, near Washington street

PUBLIC BUSINESS SCHOOL FOR GIRLS

Boston Clerical School, Warren and Montrose streets, Roxbury

Offices of the Board of Superintendents,
Boston, April 24, 1922.

To Pupils Who Are Planning to Enter Secondary Schools, and to Their Parents.

My dear Friends:

From present indications approximately 25,000 pupils will be enrolled in Grades IX to XII of the public schools of Boston next September. It appears that our city is rapidly approaching the stage in its educational development where secondary school attendance will be well-nigh universal. Fortunately, it is unnecessary to discuss the advantages of secondary education. It is generally recognized that this extended period of training multiplies the productive and earning powers of the individual pupil, adds greatly to his capacity for enjoyment, and in an exceptional degree prepares him for the duties of citizenship. The benefits derived from secondary education are so evident and so enduring that parents often forego luxuries and even make heroic sacrifices in order that their children may possess this invaluable equipment.

Equally important with the purpose to attend secondary schools is the selection of the work the pupil is to undertake there. For the assistance of parents and pupils in making a proper choice of schools and courses of study, this little book of information has been prepared. It attempts to describe briefly the different types of secondary schools and the variety of courses that have been provided for our young people by the School Committee of Boston. Parents and pupils are invited to study the pamphlet carefully, and in deciding upon a special school or a particular course of instruction, parents are urged to keep in mind, so far as possible, the capabilities and the natural inclinations of their children. One pupil may be adapted to the pursuit of a classical course, another to commercial work, a third to industrial activities, a fourth to practical arts

pursuits, and so on. All these courses are equally important, and the one most appropriate for a child to elect is that which most closely conforms to his own peculiar natural "bent"— to his desires and capacities.

The Department of Vocational Guidance and in fact the machinery of the whole school system will co-operate heartily in helping parents and pupils to reach a wise decision. Parents and pupils, therefore, are requested to confer with principals, directors and teachers in order that from all available sources they may obtain the light necessary for the solution of their all-absorbing problems.

May I express the personal wish that the selections of schools and courses of study may be intelligently made, that the pupils may be guided into work that is congenial and profitable, that they may make a creditable use of the opportunities afforded them, and that as a result of all our united efforts an exemplary type of citizenship may be assured for the Boston of tomorrow.

Yours sincerely,

JEREMIAH E. BURKE,
Superintendent of Public Schools.

TRAINING FOR ACADEMIC PROFESSIONS

If you wish to become a CLERGYMAN, a DENTIST, a DOCTOR, a JOURNALIST, a LAWYER, or a TEACHER, a Latin School or a High School education is absolutely necessary. You should take the *College Preparatory Course* offered in the Latin Schools and in all High Schools, except the High School of Commerce, High School of Practical Arts and Mechanic Arts High School. If you expect to go to college or to a professional school you should consult the principal or vocational counselor, *on entering* Latin School or High School, in order that you may take those studies that will give you the best preparation for the particular college or professional school you plan to enter.

Courtesy of the Boston Advertiser

PHYSICS LABORATORY — A CLASS IN LINEAR EXPANSION

TRAINING FOR ENGINEERING PROFESSIONS

Probably you know someone who runs the locomotive on a train (called a locomotive engineer); or a man who superintends the firemen in the heating or lighting plant of a large building (called a stationary engineer); but do you know that there are other engineers whose work requires a more intensive type of technical education? Before we can have train service we must have tracks for the trains to run on. The planning and laying out of the route for a railroad is done by the CIVIL ENGINEER. The skill of the MINING ENGINEER is needed to locate the mineral lands from which the ore for the rails is obtained. The METALLURGICAL ENGINEER tests the ore, and selects the best method for extracting the metal. The MECHANICAL ENGINEER designs the machines which are used in mining the ore, in extracting the metal, in making this metal into rails, and the machinery used in laying these rails. In large cities, the talent of the ARCHITECTURAL ENGINEER is required to design the stations at which the trains will stop.

Ask your teacher or vocational counselor to tell you about the work of these engineers:

CHEMICAL ENGINEER
CONSTRUCTION ENGINEER
ELECTRICAL ENGINEER
MUNICIPAL ENGINEER
TEXTILE ENGINEER
SANITARY ENGINEER

If you wish to prepare for any of these lines of engineering work you should take the *Technical Preparatory Course* offered in Latin and High Schools.

TRAINING FOR TEACHING

GIRLS

Would you like to be a teacher? If so, in which are you most interested, the kindergarten, the elementary school, or the high school?

The *Normal Course* in high school will prepare you to enter Boston Normal School where you may take either of these courses:

The Kindergarten — Primary Course
If you wish to teach in the Kindergarten or in the first three grades.

The Elementary Course
If you wish to teach in grades one to six.

A College Course
If you wish to teach in grades seven to twelve. Four-year courses are offered leading to the degree of Bachelor of Education or of Bachelor of Science in Education.

Do you think you would like to teach special subjects? If BOOKKEEPING and STENOGRAPHY interest you, you must have a college degree as well as training in your chosen subject. If you wish to teach SEWING or COOKING you may take the *Normal Course* in high school, which will prepare you to enter a State Normal School, or other institution where you may obtain the necessary training.

BOYS

If you want to teach you should go to Latin School, or take the *College Preparatory Course* in high school, for you must have a college education if you are to teach the regular school subjects.

Ask your teacher or vocational counselor to tell you about other opportunities in the teaching profession.

TRAINING FOR ART OR MUSIC

ART

If you desire an art education in order that you may, with specialized training, become a DESIGNER, or an INTERIOR DECORATOR, or in order that you may enter the field of COMMERCIAL ART you may supplement the art work offered in high school, by taking a course afternoons in the Art School of the Museum of Fine Arts, for which credit is allowed in the High School of Practical Arts, and in general high schools. This course is made available through the co-operation of the Boston School Committee and the Museum of Fine Arts.

Free scholarships are available for graduates of elementary schools, whose work is approved by the Director of Manual Arts and the Director of the Educational Department of the Museum of Fine Arts. Graduates failing to secure scholarships may take the course upon payment of the nominal fee of twenty-five dollars ($25).

MUSIC

Do you wish to specialize in MUSIC? The musician of today requires a broad, thorough, general education, just as truly as the person who plans to enter professional or business life. To this end, if you expect to become a PROFESSIONAL MUSICIAN you should take the *College Preparatory*, or *General Course* in high school with a view to attending college, if possible. The high school glee clubs, orchestras, and the School Symphony Orchestra provide excellent opportunities for pupils with special ability to secure valuable musical training along with their school work, and with no additional expense.

TRAINING FOR ART OR MUSIC

A Class in Design

"To have a taste for good literature, fine art, and worth-while music, to find pleasure in the competition of games, and to enjoy the wonders of the great outdoors insures an extended measure of happiness to the individual and increased tranquility for the state."

TRAINING FOR BUSINESS LIFE

If you wish to enter business as a STENOGRAPHER, a TYPIST, a BOOKKEEPER, or as a SALESMAN or SALESWOMAN, take the four years' *Commercial Course* given in all high schools, with the exception of Mechanic Arts High School. The High School of Practical Arts offers a *Commercial Course* without stenography.

The Commercial Course has a threefold objective. Pupils in the third and fourth years of high school are asked to specialize in one of three commercial fields:

1. Bookkeeping
2. Stenographic, or secretarial work
3. Merchandising, for boys, salesmanship, or retail selling, for girls (see pages 12–14.)

Girls, do you know that at the BOSTON CLERICAL SCHOOL you may obtain, without expense, a business education equivalent to that offered in any business school in the city? You may enter this school after you graduate from high school, or after you have completed two or more years in any high school. Here you may prepare for positions as bookkeepers, clerical workers, stenographers, and secretaries. You may enroll on any school day in September, and on any Monday thereafter, when the school is in session. This is possible because of the individual nature of the work.

> "Business, once a trade, is becoming a profession with its lines of special service. Every large establishment has its expert advertiser, buyer, credit man, sales chief, accountant, and business manager. Every large bank has its expert upon insurance, industrial loans, farm loans, foreign exchange, credits, income tax, inheritance, occupation, and profits tax. More and more, we are relying upon the persons of unusual training, experience, and skill."

TRAINING FOR SALESMANSHIP

Have you ever thought, when visiting a store, how many people have had a share in the production and sale of every article? For the food we eat, the clothes we wear, the furniture we use, the books we read,— in fact, for the satisfying of almost any of our daily needs, we depend in part on those engaged in wholesale and retail selling.

There are certain characteristics which it is important for one to have, if one is to succeed as a salesman, or saleswoman. Some of these are a cheerful disposition, a pleasing manner, a neat personal appearance, the ability to get along with people, patience, good judgment, orderliness, a knowledge of arithmetic, and the use of good English.

BOYS

If you possess these qualities, perhaps SALESMANSHIP will interest you. You may take courses dealing with wholesale and retail selling and merchandising at

High School of Commerce	Dorchester High School
English High School	West Roxbury High School

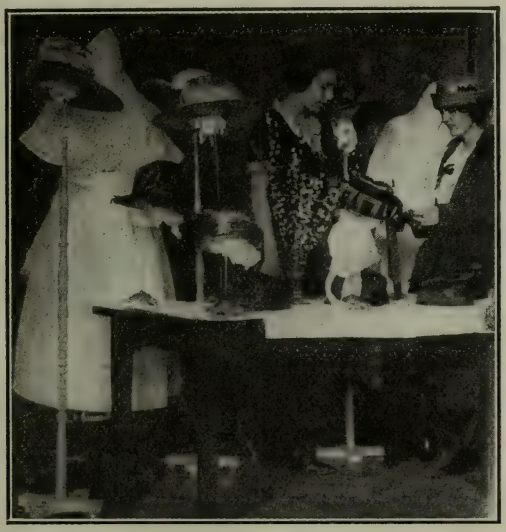
The first two years you will study subjects that will give you a substantial business background. You may then specialize in one of the several branches of salesmanship during your third and fourth years in high school. Store practice is considered an important part of the training, hence, so far as possible, you will work in the stores Saturdays, and during part or all of the Christmas vacation, at the regular rate of pay for temporary work.

> "Salesmen will be recruited from the ranks of graduates of high school and college courses in commerce, and salesmen will be taught in a manner similar to the present teaching of other vocations in industrial schools."

TRAINING FOR SALESMANSIHP

GIRLS

Do you like to meet people? Do you enjoy handling dainty articles? Would you like to be a saleswoman? To prepare for this work, you may do one of two things: Take the *Co-operative Course* given at the HIGH SCHOOL OF PRACTICAL ARTS. The first two years you will receive a general high school education, and during the third and fourth years you will spend alternate weeks in school and working in the stores. For the time you are at work you will receive pay at the rate customary for temporary work. This course makes it possible for you to participate in business life while you are still in school, and to get practical experience that will be valuable to you in securing a position when you finish school, and last but not least, you will be able to "earn while you learn."



A DEMONSTRATION SALE

TRAINING FOR SALESMANSIHP

Or you may take the

Part-time Course during the third or fourth years of high school in any one of these schools:

Brighton High School
Charlestown High School
Dorchester High School
East Boston High School
Girls' High School
High School of Practical Arts
Roxbury High School
South Boston High School
West Roxbury High School

Store practice forms an important part of this course also, but instead of working every other week, you will work in the stores on Saturdays only, and during one, two, or three weeks before Christmas, and during one week of your Easter vacation. You will be paid for the time you work.

TRAINING FOR HOME MAKING

Learning to be Useful in the Home

TRAINING FOR HOME MAKING

GIRLS

Do you want to be prepared to manage you own home successfully? To do this you must know how to buy nourishing food, and how to cook it in an appetizing way. A course in MARKETING and COOKING will help you.

Would you like to make your own dresses and hats? The courses in DRESSMAKING and MILLINERY DESIGN will aid you.

Do you know why some homes attract you more than others? Have you ever thought of the importance of the color scheme carried out in wall paper, paint and furnishings? Perhaps you can learn to make your home more interesting and attractive by taking a course in Interior Decoration, and Applied Art in the Home.

Such subjects may be studied as a part of the regular course in the following schools:

BRIGHTON HIGH SCHOOL	Cooking, Food Study, Cafeteria Work; Interior Decoration with Applied Art in the Home; Home Sanitation.
CHARLESTOWN HIGH SCHOOL	Cooking, Food Study, Cafeteria Work; Home Sanitation.
DORCHESTER HIGH SCHOOL	Sewing, Dressmaking, Textiles, Costume and Millinery Design with Applied Art.
HYDE PARK HIGH SCHOOL	Cooking, Food Study, Cafeteria Work; Interior Decoration with Applied Art in the Home; Home Sanitation; Sewing, Dressmaking, Textiles, Costume Design.
HIGH SCHOOL OF PRACTICAL ARTS	Cooking, Food Study, Marketing, Domestic Science, Household Accounts, Housekeeping, Home Sanitation; Costume Design, Theory of Color, Dressmaking, Millinery, Textiles.

You will find these courses of value if you wish to enter one of these occupations: MILLINERY, DRESSMAKING, ALTERATION SEWING, COSTUME DESIGNING, INTERIOR DECORATING, CAFETERIA MANAGEMENT, or COOKING.

TRAINING FOR MANUFACTURING

Do you like to make things? Before goods are ready for selling, they must be made, or manufactured, as we say. Do you know that nearly seven million people in the UNITED STATES are engaged in some form of productive industry? Do you realize that your own state, MASSACHUSETTS, occupies fourth position among all the states of the Union in the value of its manufactured products, and first in the production of boots and shoes and cotton goods? Perhaps you know that some of the prominent industries of greater Boston are:

Boots and Shoes	Woolen Goods	Electrical Machinery
Cotton Goods	Cutlery	Confectionery

READ what the manufacturers in this country say about the value of an education.

> "There is always a place for a man equally as large as he is mentally."
>
> "The opportunity for advancement will depend upon the individual."
>
> "Every person is dependent upon himself, and is advanced according to his ability."

CHARLES M. SCHWAB, President of the Bethlehem Steel Company, says:

> "An employer picks out his assistants from the best informed, most competent, and conscientious. A man to be successful, even as a specialist, should have a good general knowledge, and therefore ought to read and study much; a well informed man is always the better for it. All through my life I have read and studied."

You must appreciate that more education will help you to do better your share in maintaining the present high industrial position of Massachusetts among the states of the Union.

TRAINING FOR INDUSTRY THROUGH THE CO-OPERATIVE COURSES FOR BOYS

"The Real American Works"

Are you anxious to be a part of the working world as early as possible? Have you a desire to help out financially at home? If so, one of the following *Co-operative Courses* will help you:

Agriculture	West Roxbury High School
Auto-Mechanics . . .	Brighton High School
Electrical Work . . .	Charlestown High School
Machine Shop Work . .	East Boston High School and Hyde Park High School
Woodworking	Dorchester High School

You should select the high school offering the course that most interests you and in which it seems that you will be most successful. During the first year, as a part of your school work, you will study the various branches of your chosen trade, and you will visit local industries. You will then be placed in a position, if possible, preferably with some establishment near your home. Here you will work part or all of the vacations, and every other week during the school year, in your second, third and fourth years in high school. For this work you will be paid at a rate agreed upon with your employer. The weeks that you are not working you will spend in study at school. After the fourth year full time is given to trade work. An industrial certificate is granted at the end of your four years in high school and a diploma upon the completion of a required number of apprenticeship hours. This requirement is usually fulfilled about the end of the first year out of school. You then become a graduate apprentice and may advance as rapidly as your ability warrants.

These courses are open to boys from any part of the city.

TRAINING FOR INDUSTRY

AGRICULTURE

Do you know that three out of every ten people in the United States are farmers? And do you realize that all the rest of us are dependent upon the farmer for our food and much of our clothing? We who live in cities and who, as a rule, see only the finished product, are apt to overlook the many and varied opportunities in the field of agriculture. Are you interested in any of these vocations:

Poultry Raising	Dairying
Fruit Growing	Floriculture
Market Gardening	Landscape Gardening
Truck Farming	Forestry

If so, the *Co-operative Agricultural Course* given in the West Roxbury High School will help you. To enter this course you must be fourteen years old, and a graduate of an elementary school.

In this course you will learn those principles which are most necessary for you to know in order to enter one of these vocations. Afternoons you will work on estates, in greenhouses, in Franklin Park, and other places, where you will put into actual practice, under the direction of experienced employees, the work covered in the school room. For this work you will receive pay.

Graduates of the co-operative agricultural course, and other high school graduates who can qualify and who wish to specialize in agriculture, forestry, or animal husbandry, may enter Massachusetts Agricultural College, Amherst, Mass. Tuition in this college is free to residents of Massachusetts.

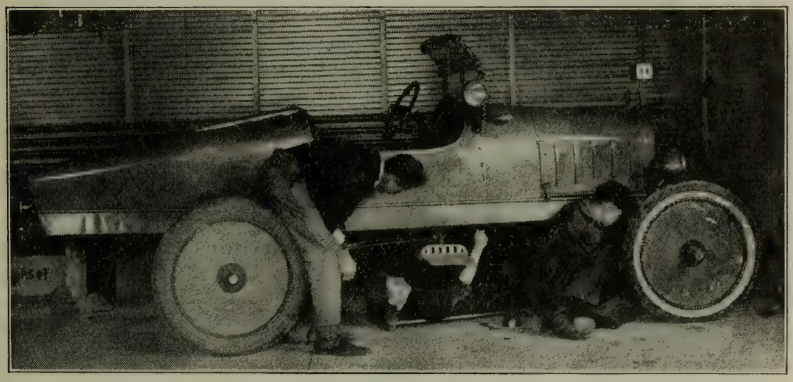
TRAINING FOR INDUSTRY

AUTO–MECHANICS

Are you interested in automobiles? Would you like to work in a garage, or for an automobile manufacturing concern? If so, you should learn about all kinds of cars, and how to repair them. Brighton High School offers a co-operative course in *Auto-Mechanics*, where you may specialize in one of these branches:

ENGINES IGNITION TRANSMISSIONS

To be successful in this work you must be a large, strong boy.



ELECTRICAL WORK

Do you wish to become an expert electrician? The co-operative course at Charlestown High School gives you an opportunity to learn the fundamentals of the electrical trade. You may then specialize in any of the following lines:

Auto Electrics

Battery Building

Electrical Repairing

House Wiring

Plant Electrician

TRAINING FOR INDUSTRY

MACHINE SHOP WORK

Do you enjoy working on machines? In East Boston High School, or Hyde Park High School, you may take a co-operative course that will prepare you for positions in the metal working and closely allied industries, such as:

Machine Shop Practice

Sheet Metal Work

Pattern Making

Foundry Practice

Mechanical Drafting

WOODWORKING

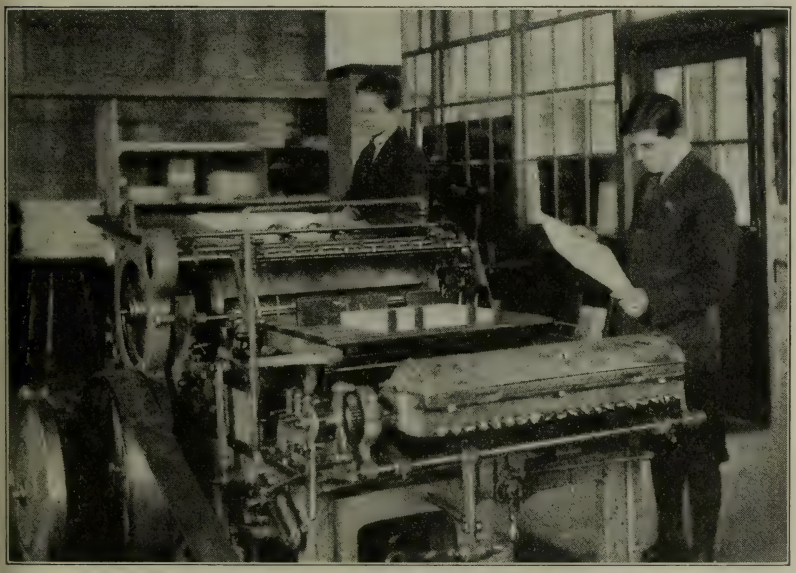
Would you like to be a CARPENTER, a CABINET MAKER, a FURNITURE MAKER, a PATTERN MAKER, an ARCHITECTURAL or DESIGNING DRAFTSMAN, or would you like to engage in any of the other woodworking trades? If so, the co-operative course at the Dorchester High School will prepare you for work in any of these lines you select.

THE BOSTON TRADE SCHOOL—BOYS

The Boston Trade School offers courses that will enable you to become a skilled apprentice in any one of these trades:

Auto Mechanics	Electricity
Cabinetmaking	Machine Practice
Carpentry	Printing
Sheet Metal Work	

At the same time you will get a broad, well-balanced English education. To enter this school you must be at least fourteen years old, a bright boy with a grammar school education, and you must show that you can carry on the work of the school. In two years you can learn the things you most need to know about your chosen trade.



"You cannot expect to master in a few months or a year the principles that make for achievement in business and industry. Sound preparation is needed and that is a matter of continuous, steady growth. Four full years in high, or trade school will prove in the long run the quickest way to success."

THE TRADE SCHOOL FOR GIRLS

If you are a girl fourteen years of age, or over, and feel that you cannot possibly go to high school visit the TRADE SCHOOL FOR GIRLS, at 620 Massachusetts avenue, and learn about the many interesting opportunities that are open to you. Here you may prepare, as rapidly as your ability will permit, for work in any one of these occupations:

Dressmaking	Catering
Millinery	Cotton and Linen Wear
Children's Wear	Trade Design
Machine Operating	Novelties

A part of each day is devoted to instruction in English, Design and other related subjects.

A LESSON IN PRESERVING

TRAINING FOR OTHER OCCUPATIONS

As you will realize this pamphlet has attempted to mention only a few of the many kinds of work that will be open to you at the end of your high school, or trade school course, but it is hoped that these suggestions may lead you to *think more about what you really want to do in the future.* You will *enjoy your school life more,* and will be more likely to *select your studies intelligently* if you have a *definite goal in view.*

Ask your teacher, or vocational counselor, to tell you about CIVIL SERVICE positions; about the preparation necessary to become a NURSE, a DIETITIAN, a LIBRARIAN or about any occupation that interests you.

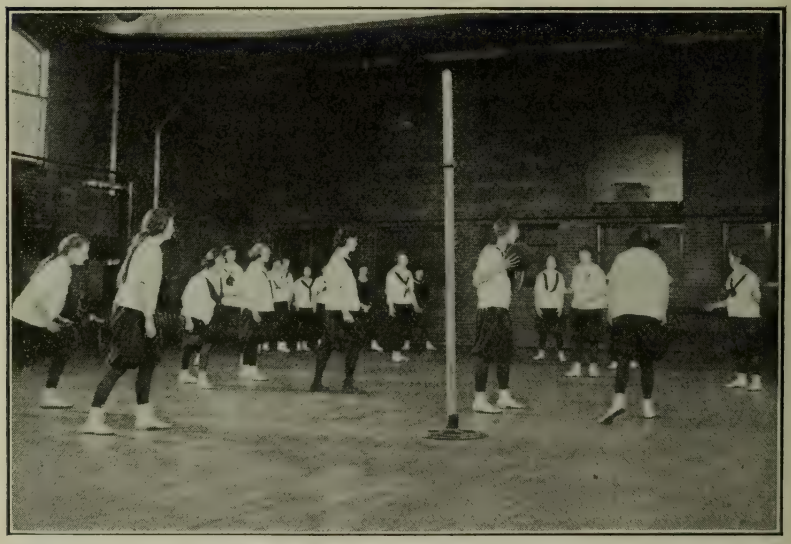
If you are still doubtful which course to take in High School, you will make no mistake in electing the *General Course.* This course will give you a good all-round education, including History, English, Mathematics, Foreign Languages, Science, and many other subjects.

TRAINING FOR HEALTH

A strong, healthy, well-nourished body will be a great help to you in attaining success in your life work, and in enabling you to get the greatest enjoyment from life. The gymnasium exercises and athletics, in connection with your high school course are planned to develop your muscles and to make you "physically fit," just as your class work aims to make you "mentally fit."

"Health Pays Dividends"

"The best way for a man to be patriotic is to keep in good health."



Courtesy of the Boston Advertiser

A Game of Bat Ball

LATIN, HIGH AND TRADE SCHOOL ACTIVITIES

If education does not teach us to play as well as to work, it has failed to accomplish its full purpose. For this reason there are conducted in the schools such student activities as seem best adapted to the pupils. You will not find all of the following activities in every school, but you will find some of them in each school:

Dramatics
Orchestra
School Papers
Military Drill

Athletic Teams:
- Base Ball
- Basket Ball
- Foot Ball
- Hockey
- Rifle
- Swimming
- Tennis
- Track and Field

Military Drill

"Some of the essential elements of leadership are initiative, originality, responsibility, poise and especially ability to get along with others. One of the best means of developing these qualities is through student activities."

ADDITIONAL FACTS

LATIN AND HIGH SCHOOLS

The Public Latin School (Boys) and the Girls' Latin School aim to prepare boys and girls for college. They are open to pupils from any part of the city, but only to those whose parents or guardians present a written statement of their intention to give such pupils a college education. In each school there are two distinct courses of study; one, four years in length for elementary school graduates; and the other, six years in length, for those who have completed the sixth grade with at least a B grade.

The English High School, for *boys*, and the Girls' High School, for *girls*, are general high schools, which receive pupils who reside within the city proper, and other pupils in the order of application until the seating capacity of the school is exhausted.

Roxbury High School, for *girls*, accepts pupils from any part of Roxbury, from portions of Dorchester and West Roxbury, and overflow classes from Girls' High School.

The High School of Commerce aims to train boys for business life. To accomplish this the school works in two ways. First, it provides instruction in the history, conditions and principles of business; second, it provides opportunity for practical experience through aiding the boy to secure work at the Christmas season, during the summer vacation, and at various other periods of the year. This school receives pupils from any part of the city, until the capacity of the school is exhausted.

The High School of Practical Arts, for *girls*, offers a general high school academic course together with highly specialized vocational training in home making, dressmaking, millinery, retail selling, drawing and design, and clerical work.

Mechanic Arts High School, for *boys*, offers two distinct courses. One course teaches the processes that are fundamental to many trades, with a view to preparing its

pupils for advancement to positions in which mechanical insight and judgment are essential to success. In many cases the approach to such positions is through the workshop and the training which the school gives leads to rapid advancement. The other course prepares boys for Massachusetts Institute of Technology, Lowell Technical School, and other technical schools.

The SUBURBAN HIGH SCHOOLS provide educational opportunities for boys and girls in their home districts. Pupils are thus saved the expense and discomfort of street car travel. These schools are equal in rank, and the teaching forces are of the same high grade as in the central high schools. The co-operative courses offered in these schools are open to boys from all parts of the city.

CONTINUATION SCHOOL

Boys and girls who leave school to go to work, and who are under sixteen years of age, are required to attend CONTINUATION SCHOOL one-half day each week. The purpose of the school is to help the pupils to gain a wider general knowledge and to give them a better understanding of the work they are doing, in order that they may be more efficient. The Continuation School assists pupils who are temporarily out of work to obtain new employment. The boys' school is in the Brimmer Building on Common street. The girls' school is at 25 La Grange street. Some classes are held in stores and factories. The Household Arts Department is at 52 Tileston street. The school is in session from 8 to 12 a. m., and from 1 to 5 p. m. each school day. Anyone wishing to attend evening school *in addition* to Continuation School may do so upon securing the approval of the Director of Evening Schools, but evening school attendance cannot be substituted for attendance at Continuation School.

EVENING SCHOOLS

Boys and girls who are over sixteen years of age and who for any reason have left day school may easily continue their education by attending evening school. Those

who have not completed day elementary school should join the nearest evening elementary school and study for an elementary school diploma. Evening elementary schools are located in every section of the city. Besides classes for those preparing for graduation, the evening elementary schools offer to girls over sixteen years of age practical instruction in cookery, dressmaking, embroidery, millinery and home nursing.

Those who have been graduated from day elementary school and those who have at any time attended day high school should enter the nearest evening high school. The evening high schools are located in the following buildings:

School	Street	District
Brighton	Cambridge and Warren streets	Brighton
Central (English High building).	Montgomery street	South End
Charlestown	Monument square	Charlestown
Dorchester	Washington street and Talbot avenue,	Dorchester
East Boston	Marion and Saratoga streets	East Boston
Girls'	West Newton street	South End
Hyde Park	Harvard avenue and Everett street	Hyde Park
Roxbury	Warren and Montrose streets	Roxbury
South Boston	Thomas Park and G street	South Boston

The Central Evening High School offers both academic and commercial courses. The other evening high schools offer only commercial courses. Diplomas are granted for completion of a general academic course, a general commercial course, or any one of the following specialized courses: The secretarial course, which emphasizes a mastery of phonography and typewriting; the accountancy course, which includes the principles and practices of advanced bookkeeping; the merchandising course, which includes the principles of business organization, selling and service to customers; and the office practice course, which includes the principles and methods of adjusting one's self to modern business office conditions, and familiarity with the principles of filing systems and labor-saving machines and devices.

Diplomas are awarded for the satisfactory completion

of four years' work, but work satisfactorily completed in day high schools may be counted towards an evening high school diploma.

The evening classes of the Boston Trade School and the late afternoon extension classes of the Trade School for Girls are open to those over sixteen years of age *who are employed during the day time in a trade* and who desire further instruction in that trade.

The term of the evening school begins on the last Monday in September and continues through the week immediately preceding the April vacation. Sessions are held on Monday, Tuesday and Thursday evenings from 7.30 to 9.30.

SUMMER REVIEW SCHOOLS

ELEMENTARY SCHOOLS

Boys and girls of Grade VIII, those of you who have made your choice of secondary schools but who find yourselves ineligible for admission because you have not received credit in at least two major subjects, may, with the approval of your principal, enter a summer review elementary school. By successfully completing the work in the subjects in which you have failed, you may enter, in September, the high school of your choice.

In case you have earned a sufficient number of points to enter high school, but have not received full credit in all subjects in Grade VIII, you should attend the summer review elementary school, make up the work in studies in which you have failed, and continue on to high school with a clear record and without any conditions.

These elementary review schools are located in all sections of the city. Sessions are from 8.30 a. m. to 11.30 a.m. daily, Saturdays included, for forty days immediately following the close of school in June. Instruction is offered in all subjects of the elementary course of study by the very best regular day school teachers available. Consult the summer review school counselor in your school.

HIGH SCHOOL

Boys and girls of Grades IX to XII, you may find in the Summer Review High School just the assistance you need. If you have failed in one or two subjects you may have the opportunity to regain regular class standing by requesting your headmaster to recommend you for enrollment at the Summer Review High School. Regular attendance and daily application to study throughout the summer session will enable you to complete satisfactorily the work in which you have failed and will earn for you the certificate which will permit you to advance with your class.

If you wish to earn advanced credit, the Summer Review High School will be of service to you also. In the first place, however, you must be pupils of honor grade in your school; then you must receive the approval of your headmaster in order to be admitted; and finally you must be willing to study intensively one subject throughout the summer term.

It is interesting to know that about 80 per cent of the pupils who review subjects because of failure, obtain full credit, while approximately 100 per cent of those seeking advanced credit are successful. Thus the Summer Review High School is a real opportunity for every ambitious boy or girl.

There are usually about twenty-five teachers in the Summer Review High School chosen from among the very ablest instructors that can be found in our high schools. They are selected for this work because they are excellent teachers, because they understand the difficulties of the pupils, and because they are patient, sympathetic, and anxious to be of help to all boys and girls who need or desire their assistance.

The Summer Review High School is located in the Roxbury High School building on Warren street, near the Dudley Street Station of the elevated. Sessions are from 8 to 12 m. daily, Saturdays included, for forty days immediately following the close of school in June. Consult the summer review school counselor in your school.

DEPARTMENT OF VOCATIONAL GUIDANCE

The DEPARTMENT OF VOCATIONAL GUIDANCE was organized by the Boston School Committee for the purpose of assisting boys and girls who wish information in regard to further educational or vocational opportunities.

When the time comes for you to enter the business or the industrial world, this department stands ready to assist you in every way. You are advised to confer with us through the Vocational Counselor in your school. If he, or she, cannot give you the information you desire, you will be referred to this office.

The Department of Vocational Guidance, which includes the Boston Placement Bureau, is located at 218 Tremont street, Room 206. After September 1, 1922, the address will be 15 Beacon street.

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SCHOOL DOCUMENT NO. 3—1922

BOSTON PUBLIC SCHOOLS

REAPPOINTMENTS OF TEACHERS AND MEMBERS OF SUPERVISING STAFF

BOSTON
PRINTING DEPARTMENT
1922

REAPPOINTMENTS OF TEACHERS AND MEMBERS OF SUPERVISING STAFF.

In School Committee, June 19, 1922.

To the School Committee.

In accordance with section 264 of the Regulations, I herewith submit a list of reappointments for the school year 1922–23 together with a statement of the number of teachers to which each school and school district is entitled, and the number of pupils upon which the quota of teachers is based. All reappointments are made subject to the provisions of the Regulations governing promotional examinations.

All reappointments of high school teachers are based upon the provisions contained in section 293 of the Regulations.

The computation is based upon a report received from each head master as of October 3, 1922.

All reappointments of elementary and intermediate school teachers are made on the basis of one teacher for every thirty-five pupils in Grade IX, and one teacher for every forty pupils in all other grades. The appointment of new teachers during the current school year has been made on the basis of forty pupils in the first, seventh and eighth grades, thirty-five pupils in Grade IX and forty-two pupils in grades from the second to the sixth. In consequence of this difference in the basis of appointment of new teachers and the reappointments of teachers for the ensuing school year, the reports which follow indicate a considerable number of elementary school vacancies, but these are technical rather than actual vacancies,— that is, they are vacancies on the basis of forty pupils for Grades I to VIII, inclusive, and thirty-five pupils for Grade IX. Except as hereinafter explained, there are no teachers in excess of the Regulations.

Excess Teachers.

In the High School of Practical Arts there is one teacher in excess of the number allowed under the Regulations. During the current school year this teacher was assigned to the Department of Household Science and Arts. I recommend that this teacher be allowed to remain in the school until the fall, at which time the membership may warrant her retention; if not, her transfer may be effected.

In the Quincy District there is one kindergarten teacher in excess of the number allowed under the Regulations. I recommend that this teacher be allowed to remain in the school until the fall, at which time the membership may warrant her retention; if not, her transfer may be effected.

Submasters.

In the following districts submasters are employed in excess of the Regulations:

Elihu Greenwood.— One. This submaster has been allowed in previous years for assignment to the Fairmount School, in which there are several upper grades. I recommend that a teacher of said rank be continued in the foregoing district during the school year ending August 31, 1923.

Frederic W. Lincoln.— One. This submaster has been allowed in previous years. I recommend that a teacher of said rank be continued in the foregoing district during the school year ending August 31, 1923.

Sherwin.— One. This submaster has been allowed in previous years. I recommend that a teacher of said rank be continued in the foregoing district during the school year ending August 31, 1923.

In each of the following districts there is one additional submaster in charge of the pupils above the third grade as authorized by the School Committee:

Charles Sumner.

Dearborn.

Eliot.
Henry L. Pierce.
Hugh O'Brien.
Oliver Wendell Holmes Intermediate.— Two.
Phillips Brooks.
Quincy.
Thomas Gardner.
Washington.

I recommend that they be continued during the school year ending August 31, 1923.

Master's Assistants.

Abraham Lincoln.— One. This master's assistant has been allowed in previous years. I recommend that a teacher of said rank be continued in the foregoing district during the school year ending August 31, 1923.

Blackinton-John Cheverus.— One. This master's assistant has been allowed in previous years. I recommend that a teacher of said rank be continued in the foregoing district during the school year ending August 31, 1923.

First Assistants, Grammar School.

In each of the following districts the position of first assistant, grammar school, is to be abolished on the retirement of the present incumbents:

Bowditch.— One.
Bowdoin.— One.
Charles Sumner.— One.
Dearborn.— One.
Gaston.— One.
Harvard-Frothingham.— One.
Henry L. Pierce.— One.
Jefferson.— One.
John Winthrop.— One.
Longfellow.— One.
Oliver Hazard Perry.— One.
Robert Gould Shaw.— One.
Ulysses S. Grant.— One.

First Assistants in Charge.

In each of the following districts there is one first assistant in charge in excess or in addition to the number authorized by the Regulations:

Abraham Lincoln.
Edward Everett.
Eliot.
Harvard-Frothingham.
Hyde.
Martin.
Oliver Wendell Holmes Intermediate.
Robert Gould Shaw.
Sherwin.— Two.
Washington.

I recommend that teachers of said rank be continued in the foregoing districts during the school year ending August 31, 1923.

First Assistant, Primary School.

In the following district the position of first assistant, primary school, has been continued from year to year by order of the Board:

Hugh O'Brien District, Samuel W. Mason School.— One.

I recommend that the rank be continued during the school year ending August 31, 1923.

Teachers Taken From Tenure.

One teacher who had previously been appointed to serve during the pleasure of the School Committee has been taken from tenure and reappointed for the year ending August 31, 1923, as follows:

Department of Manual Arts.— One assistant instructor in manual training.

Conservation of Eyesight Classes.

I hereby re-establish conservation of eyesight classes in the following districts for the year 1922–23:

Blackinton-John Cheverus.— One.
Dudley.— One.
Franklin.— Two.
Harvard-Frothingham.— One.
Martin.— One.
Norcross.— One.
Wells.— One.

Special Classes.

I hereby re-establish special classes in the following districts for the year 1922–23:

Abraham Lincoln.— Two.
Agassiz.— One.
Bennett.— Two.
Bigelow.— One.
Blackinton-John Cheverus.— Two.
Bowdoin.— Three.
Chapman.— One.
Dearborn.— One.
Dillaway.— Two.
Dudley.— One.
Dwight.— Six.
Edward Everett.— One.
Eiot.— Three.
Everett.— One.
Franklin.— One.
George Putnam Intermediate.— Two.
Hancock.— Three.
Harvard Frothingham.— Three.
Henry L. Pierce.— One.
Hugh O'Brien— One.
Hyde.— One.
Jefferson.— One.
John Marshall.— One.
John Winthrop.— One.

Julia Ward Howe.— One.
Lawrence.— One.
Longfellow.— One.
Lowell.— Two.
Mather.— One.
Norcross.— One.
Oliver Hazard Perry.— One.
Phillips Brooks.— One.
Prescott.— One.
Quincy.— Two.
Robert Gould Shaw.— One
Roger Wolcott.— One.
Samuel Adams.— One.
Sherwin.— Eight.
Theodore Lyman.— Two.
Thomas Gardner.— One.
Thomas N. Hart.— One.
Ulysses S. Grant.— One.
Warren-Bunker Hill.— Two.
Washington.— Two.
Wells.— Three.
Wendell Phillips.— Six.
William E. Endicott.— One.
William E. Russell.— One.

Speech Improvement Classes.

I hereby re-establish speech improvement classes in the following districts for the year 1922–23:

Dudley.— One.
Dwight.— One.
Everett.— One.
Franklin.— One.
Hancock.— One.
John A. Andrew.— One.
Martin.— One.
Mary Hemenway.— One.
Quincy.— One.
Ulysses S. Grant.— One.
Washington.— One.

Open-air, Ungraded, Special English and Rapid Advancement Classes.

I recommend that the same policy be pursued regarding the establishment of open-air, ungraded, special English, and rapid advancement classes as in 1921–22 and that no action concerning the re-establishment of these classes for the year 1922–23 be taken at the present time. Action should be postponed until after the opening of schools in September, when orders will be presented to the School Committee regarding the establishment of all such classes on the basis of the registration at that time. I recommend that all open-air, ungraded, special English and rapid advancement classes at present authorized be discontinued at the close of the current school year and that such classes be re-established only by special order of the School Committee.

Disciplinary Day Classes.

I hereby re-establish disciplinary day classes in the following district for the year 1922–23:

Julia Ward Howe.— Three.

PART I.

REAPPOINTMENT OF PRINCIPALS AND MEMBERS OF THE SUPERVISING STAFF.

APPOINTED: *To serve during the pleasure of the School Committee.*

South Boston High School.— Head Master, Samuel F. Tower.
West Roxbury High School.— Head Master, Maurice J. Lacey.
Dwight District.— Master, Hugh J. McElaney.
Horace Mann School.— Principal, Mabel E. Adams.
John A. Andrew District.— Master, Edgar L. Raub.
John Winthrop District.— Master, James A. Crowley.
Julia Ward Howe District.— Master, Clarence H. Jones.
Oliver Wendell Holmes Intermediate District.— Master, Alvin P. Wagg.
Ulysses S. Grant District.— Master, Chester H. Wilbar.
William Lloyd Garrison District.— Master, Mary E. Keyes.
Chief Examiner, Joel Hathaway.
Director of Evening Schools, Michael J. Downey.
First Assistant Director of Practice and Training, Katharine L. King.
Assistant Director of Manual Arts, Daniel W. O'Brien.
Primary Supervisors, Teresa R. Flaherty, Catherine G. Foley.
Vocational Instructor, Irving O. Scott.
School Nurses, Florence I. Bolles, Catherine C. Mealey, Mary B. O'Donnell, Roberta E. Pollard.

APPOINTED: *To serve for the term ending August 31, 1923.*

Public Latin School.— Head Master, Patrick T. Campbell.
East Boston High School.— Head Master, Bertram C. Richardson.
English High School.— Head Master, Walter F. Downey.
Dearborn District.— Master, John C. Riley.
Edmund P. Tileston District.— Master, Charles I. Gates.
Elihu Greenwood District.— Master, Edward J. Muldoon.
Everett District.— Master, Madeline B. Driscoll.
Frederic W. Lincoln District.— Master, Theobald A. Lynch.
John Marshall District.— Master, E. Gertrude Dudley.
Samuel Adams District.— Master, John J. Maloney.
Shurtleff District.— Master, Rose A. Carrigan.
Wells District.— Master, Alice G. Maguire.
Continuation School.— Principal, Paul V. Donovan.
Director of Penmanship, Bertha A. Connor.
Director of Extended Use of Public Schools, James T. Mulroy.
Associate Director of Manual Arts, Edward C. Emerson.
Assistant Directors of Manual Arts, Francis L. Bain, Josef Sandberg.
Assistant Director of Music, Francis M. Findlay.
Assistant Directors, Practice and Training, Emma F. Jenkins, Charlotte Rafter.
Assistants in Manual Arts, Elizabeth M. P. Bartlett, Flora L. Enright.

Assistant in Music, Mabel T. Hackett.
Research Assistant, Olivia C. Penell.
Vocational Instructor, Thomas D. Ginn.
Vocational Assistants, Ethel S. Fletcher, Bessie MacBride, Mercedes E. O'Brien, Margaret M. Sallaway.
School Nurses, Edith C. Baldwin, Marion E. Branagan, Hulda Cederstrom, Theresa A. Dolan, Mary V. Flynn, Gladys Huse, Theresa V. Kelley, Kathleen R. McCarthy, Evelyn F. McLaughlin, Mary Doherty Morse, Catherine D. Nolan, Mary I. Oakes, Mildred V. Prescott, Lauretta Quinn, Dorothy E. Ripley, Marion C. Sullivan, Christine E. Sweeney.

PART II.

REAPPOINTMENTS OF SUBORDINATE TEACHERS.

NOTE.— Physical training teachers in Normal, High and Latin Schools are given under Part III.

NORMAL SCHOOL.

Largest number of pupils belonging at any time between September 1, 1921, and April 1, 1922		305
TEACHERS.— Entitled to 16 regular teachers		16
Now serving on tenure	14	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Flora E. Billings, Regina J. Kees	2	
	—	16

PUBLIC LATIN SCHOOL.

TEACHERS.— Entitled to 39 regular teachers		39
Now serving on tenure	23	
Appointed: *To serve during the pleasure of the School Committee.*— Master, Head of Department, William H. J. Kennedy; Junior Master, Elmer R. Bowker	2	
Appointed: *To serve for the term ending August 31, 1923.*— Junior Masters, John B. FitzGerald, Wilfred F. Kelley, William F. Looney, Edward F. McKay, Charles F. Murphy, Ralph F. V. Quinn, James D. Ryan, Clinton B. Wilbur	8	
	—	33
In addition to the above-named staff of permanent teachers there were during the school year 1921–22: Three temporary teachers		3
		—
		36

GIRLS' LATIN SCHOOL.

TEACHERS.— Entitled to 28 regular teachers		28
Now serving on tenure	21	
Appointed: *To serve for the term ending August 31, 1923.*— Junior Master, Harrison G. Meserve; Assistants, Alice A. Brophy, Frances Burnce, Alice L. Cunningham, Marion C. Moreland	5	
	—	26

BRIGHTON HIGH SCHOOL.

TEACHERS.— Entitled to 24 regular teachers		24
Now serving on tenure	8	
Appointed: *To serve during the pleasure of the School Committee.*— Assistants, Ethel T. Burpee, Sylvia E. Donegan; Assistant Instructor in Manual Arts, Marjorie Loring	3	

Appointed: *To serve for the term ending August 31, 1923.*— First Assistant, Head of Department, Marion A. Hawes; Junior Masters, Joseph A. Leary, Thomas A. Scanlon; Assistants, Gertrude M. Greene, Caroline H. McCarthy, Elizabeth I. O'Neill; Co-operative Instructor, William M. Rogers; Assistant Instructor in Commercial Branches, Agnes McCloskey . 8
— 19

In addition to the above-named staff of permanent teachers there were during the school year 1921–22: Five temporary teachers 5
— 24

CHARLESTOWN HIGH SCHOOL.

TEACHERS.— Entitled to 25 regular teachers 25
Now serving on tenure 8
Appointed: *To serve during the pleasure of the School Committee.*— Master, Head of Department, Ralph C. Benedict; Assistant, Agnes A. Aubin 2
Appointed: *To serve for the term ending August 31, 1923.*— Junior Master, John A. Bergin; Assistants, Dorothea Cushing, Marion Keeler; Co-ordinator, Maurice J. Moriarty; Co-operative Instructors, Joseph H. Connors, J. Paul Dallas, Robert W. Ford, George G. Rose 8
— 18

In addition to the above-named staff of permanent teachers there were during the school year 1921–22: Four temporary teachers 4
— 22

DORCHESTER HIGH SCHOOL

TEACHERS.— Entitled to 75 regular teachers 75
Now serving on tenure 50
Appointed: *To serve during the pleasure of the School Committee.*— Co-operative Instructor, Clarence W. Goodridge . 1
Appointed: *To serve for the term ending August 31, 1923.*— First Assistant, Head of Department, Maud A. Hartwell; Junior Masters, Richard P. Bonney, George M. Morris, William J. Pendergast; Assistants, Marguerite Condon, Margaret E. Foster, Alice E. Murphy, Blanche A. Russell, Marjorie G. Smith, Josephine Wentworth; Co-operative Instructor, Arlon O. Bacon; Assistant Instructors in Commercial Branches, Marie L. Brewster, Anna J. Dolan, Marie G. Gookin . . 14
— 65

In addition to the above-named staff of permanent teachers there were during the school year 1921–22: Three junior assistants, six temporary teachers, and one teacher assigned from the Department of Manual Arts 10
— 75

EAST BOSTON HIGH SCHOOL.

TEACHERS.— Entitled to 34 regular teachers		34
Now serving on tenure	17	
Appointed: *To serve during the pleasure of the School Committee.*— Junior Master, Isaac Goddard	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Bertha C. Marshall, Mary J. Quigley, Hazel W. Ruggles; Assistant Instructors in Commercial Branches, Margaret E. Campbell, Helen T. Duffy; Co-operative Instructor, John A. Fisher	6	
	—	24
In addition to the above-named staff of permanent teachers there were during the school year 1921–22: Seven temporary teachers		7
		31

ENGLISH HIGH SCHOOL.

TEACHERS.— Entitled to 73 regular teachers		73
Now serving on tenure	48	
Appointed: *To serve during the pleasure of the School Committee.*— Master, Head of Department, William H. Sylvester; Junior Masters, Merrill C. Hill, Louis A. McCoy . . .	3	
Appointed: *To serve for the term ending August 31, 1923.*— Master, Head of Department, Walter I. Chapman; Junior Masters, Edward J. Connell, Cornelius G. Cotter, Miah J. Falvey, Joseph G. Green, Leo V. Halloran, Fred H. Kierstead, John F. McCarthy, Andrew R. McCormick, Guy A. Senesac, Edward J. Wall; Instructors in Commercial Branches, Charles F. Muldoon, Charles A. A. Weber . .	13	
	—	64
In addition to the above-named staff of permanent teachers there were during the school year 1921–22: Eight temporary teachers and two junior assistants		10
		74

There were, however, two junior masters in charge of annexes, doing no teaching and who are charged with pupil hours, so that the school was operated with 72 teachers

GIRLS' HIGH SCHOOL.

TEACHERS.— Entitled to 64 regular teachers		64
Now serving on tenure	45	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Mary D. Chadwick, Grace A. McGrath,	2	
Appointed: *To serve for the term ending August 31, 1923.*— Junior Master, William P. Quinn; Assistants, F. Louise Dacey, Mary M. Devlin, Alice Driscoll, Mary G. Hickey, Marguerite M. O'Brien, Mildred E. Smith, Olive B. White, Ellen G. Wiseman; Assistant Instructors in Commercial Branches, M. Jeannette Grady, Elizabeth E. Haggerty . .	11	
	—	58

In addition to the above-named staff of permanent teachers there were during the school year 1921-22: Two junior assistants and one temporary teacher 3

61

HIGH SCHOOL OF COMMERCE.

TEACHERS.— Entitled to 59 regular teachers 59

Now serving on tenure 30

Appointed: *To serve during the pleasure of the School Committee.*— Master, Head of Department, Edward Berge-Soler; Junior Master, John B. Casey 2

Appointed: *To serve for the term ending August 31, 1923.*— Junior Masters, Robert Bitzer, Cyril C. Conroy, Edward W. Ellsworth, Louis J. Fish, William F. Fleming, Leo T. Foster, John M. Grandfield, Leo H. Grueter, John J. A. Hennessey, Frederick J. Hurley, Laurence J. Jackson, Walter L. McLean, Alfred B. Sullivan. William F. Walsh; Instructors in Commercial Branches, Rema J. Henderson, William Ogrean . . 16

— 48

In addition to the above-named staff of permanent teachers there were during the school year 1921–22: Nine temporary teachers and one junior assistant 10

58

HIGH SCHOOL OF PRACTICAL ARTS.

TEACHERS.— Entitled to 36 regular teachers 36

Now serving on tenure 24

Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Grace T. Blanchard, Agnes L. Callaghan, Geraldine B. Kennedy, Winifred H. Nash; Assistant Instructors in Manual Arts, Mary P. Barry, Ella G. Finn; Assistant Instructor in Salesmanship, Helen J. Kiggen; Industrial Instructors, Mary W. Cauley, Carrie E. Hoit, Catherine A. Murray 10

— 34

In addition to the above-named staff of permanent teachers there were during the school year 1921-22: Two junior assistants and one temporary teacher 3

37

One of the above-named staff of permanent teachers was assigned to the Department of Household Science and Arts for the school year.

HYDE PARK HIGH SCHOOL.

TEACHERS.— Entitled to 31 regular teachers 31

Now serving on tenure 17

Appointed: *To serve during the pleasure of the School Committee.*— Assistants, Ruby G. Allen, Ruby H. Cole; Industrial Instructor, Marguerite S. King 3

Appointed: *To serve for the term ending August 31, 1923.*— Junior Masters, Daniel L. Daley, John J. Doyle, John A. Lahive; Assistants, Olive A. Beveridge, Ellen S. Keegan; Industrial Instructor, Sarah L. Cauley; Co-operative Instructors, Thomas Aykroyd, Andrew J. Leahy . . .	8	
	—	28
There were in addition to the above-named staff of permanent teachers during the school year 1921-22: One junior assistant and one teacher assigned from cookery, and one assigned from Department of Manual Arts		3
		—
		31

MECHANIC ARTS HIGH SCHOOL.

Teachers.— Entitled to 58 regular teachers		58
Now serving on tenure	32	
Appointed: *To serve during the pleasure of the School Committee.*— Master, Head of Department, Edwin F. Field; Junior Masters, Thomas J. Flinn, Albert L. Moulton, Daniel G. Town		
Appointed: *To serve for the term ending August 31, 1923.*— Masters, Heads of Departments, Ralph Knapp, Henry C. Short; Junior Masters, Guy C. Blodgett, Burton L. Cushing, James P. Farnsworth, Laurence M. Hemman, William B. Henry, Lester E. Markham, Thomas A. Pickett, Arthur R. Racine	10	
	—	46
In addition to the above-named staff of permanent teachers there were during the school year 1921-22: Three junior assistants and three temporary teachers		6
		—
		52

ROXBURY HIGH SCHOOL.

Teachers.—Entitled to 45 regular teachers		45
Now serving on tenure.	22	
Appointed: *To serve during the pleasure of the School Committee.*—Assistant, Louise Townsend; Assistant Instructors in Commercial Branches, Mary K. Austin, Alice H. M. Power; Assistant Instructor in Salesmanship, Mary G. Jennings.	4	
Appointed: *To serve for the term ending August 31, 1923.*— Junior Masters, Abraham H. Gretsch, Dennis C. Haley; Assistants, Ellen A. Barry, Marion A. Fitch, Agnes M. Gallivan, Lucile A. Harrington, Elizabeth W. Loughran, Mary J. Mohan, Sophia M. Palm, May B. Whiting; Assistant Instructors in Commercial Branches, Marion J. Cromwell, Ellen A. Regan, Gertrude L. Ward	13	
	—	39
In addition to the above-named staff of permanent teachers there were during the school year 1921-22: Five temporary teachers and one junior assistant		6
		—
		45

SOUTH BOSTON HIGH SCHOOL.

TEACHERS.— Entitled to 28 regular teachers		28
Now serving on tenure	23	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Mary C. Grandfield; Assistant Instructor in Salesmanship, Alice M. Falvey	2	
Appointed: *To serve for the term ending August 31, 1923.*— Junior Master, Joseph A. Hennessey; Assistant, Elizabeth A. Nash	2	
	—	27

WEST ROXBURY HIGH SCHOOL.

TEACHERS.— Entitled to 33 regular teachers		33
Now serving on tenure	20	
Appointed: *To serve during the pleasure of the School Committee.*— Instructor in Commercial Branches, Edward J. McCarthy	1	
Appointed: *To serve for the term ending August 31, 1923.*— Junior Masters, Arthur V. Donnelan, Thomas P. Dooley, James L. Duffy; Assistant, Katherine E. Barr; Assistant Instructors in Commercial Branches, Mary G. Gould, Katherine E. Holland; Assistant Instructor in Salesmanship, Florence R. Joyce	7	
	—	28
In addition to the above-named staff of permanent teachers there were during the school year 1921–22: Three temporary teachers		3
		31

BOSTON CLERICAL SCHOOL.

TEACHERS.— Entitled to 9 regular teachers		9
Now serving on tenure	3	
Appointed: *To serve during the pleasure of the School Committee.*— Clerical Instructor, Charles A. Cederberg; Clerical Assistants, Helen J. Gilmore, Katherine W. Ross	3	
Appointed: *To serve for the term ending August 31, 1923.*— Clerical Instructor, Basil N. Perkins; Clerical Assistant, Mae G. Smith	2	
	—	8
In addition to the above-named staff of permanent teachers there was during the school year 1921–22: One temporary teacher		1
		9

ABRAHAM LINCOLN DISTRICT.

ELEMENTARY GRADES: Largest number of pupils belonging between September 1, 1921, and April 1, 1922 — 45 in special classes; 125 in special English classes; 46 in open-air classes; 1,463 in Grades I to VI; 414 in Grades VII and VIII and 143 in Grade IX.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922	2,171

TEACHERS.— Entitled to 51 grade teachers, 3 teachers of special classes, 4 teachers of special English classes, and 1 teacher of an open-air class		59
Now serving on tenure	35	
Appointed: *To serve during the pleasure of the School Committee.*— First Assistant in Charge, Josephine L. Smith	1	
Appointed: *To serve for the term ending August 31, 1922.*— Instructor, Special Class, Elizabeth J. King; Assistants, Margaret M. Casey, Anna J. Corliss, Josephine V. Dalton, Lillian Flavin Davison, Mary I. Elliott, Anastasia Ford, Patrick L. Geary, A. Louise Kupelian, Edith M. O'Neil, Elizabeth F. Sheehan, Hannah E. Tobin, Rose C. Wallace,	13	
	—	49
KINDERGARTENS.— Teachers.— Number entitled to		3
Now serving on tenure	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Harriet M. Angell, Nye E. Griffiths	2	
	—	3

AGASSIZ DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922— 17 in a special class; 56 in prevocational classes; 485 in Grades I to VI; 164 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		697
TEACHERS.— Entitled to 16 grade teachers, 1 teacher of a special class, and 2 teachers of prevocational classes		19
Now serving on tenure	15	
Appointed: *To serve for the term ending August 31, 1923.*— Submaster, James H. Nolan; Prevocational Assistant, Elsie V. Karlson	2	
	—	17
KINDERGARTENS.— Teachers.— Number entitled to		2
Now serving on tenure	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Christine Chapin	1	
	—	2

BENNETT DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922,— 15 in a special class; 1,373 in Grades I to VI; 341 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,696
TEACHERS.— Entitled to 43 grade teachers, and 1 teacher of a special class		44
Now serving on tenure	29	
Appointed: *To serve during the pleasure of the School Committee.*— First Assistant in Charge, Ella J. Costello; Assistant, Ruth V. Tobin	2	

Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Agnes L. Benson, Mary F. Cavanaugh, Ruth E. Clarke, Ruth E. Delano, Helen T. Fitzgerald, Melania E. Ford, Marguerite Mackay, Mary L. O'Callaghan, Frances E. O'Leary, Dorothy C. Peterson, Gertrude M. Wyeth.	11	
	—	42
KINDERGARTENS.— Teachers.— Number entitled to		7
Now serving on tenure	3	
Appointed: *To serve for the term ending August 31, 1923.*— First Assistant, Katherine D. Warren; Assistant, Emma V. Thomas	2	
	—	5

BIGELOW DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 16 in a special class; 670 in Grades I to VI; 206 in Grades VII and VIII; 75 in Grade IX.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		948
TEACHERS.— Entitled to 24 grade teachers, and 1 teacher of a special class		25
Now serving on tenure	17	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Madeline M. Fitzgerald, Mary H. Hurley, Isabelle J. Murray	3	
	—	20
KINDERGARTENS.— Teachers.— Number entitled to		3
Appointed: *To serve during the pleasure of the School Committee.*— First Assistant, Ruth E. Small	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Anna M. Doherty	1	
	—	2

BLACKINTON-JOHN CHEVERUS DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 35 in special classes; 1,161 in Grades I to VI; 315 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,652
TEACHERS.— Entitled to 37 grade teachers, and 2 teachers of special classes		39
Now serving on tenure	24	
Appointed: *To serve during the pleasure of the School Committee.*— Assistants, Marie J. Alexander, Zetta Morrison.	2	
Appointed: *To serve for the term ending August 31, 1923.*— Instructor, Special Class, Louisa C. Thomas; Assistants, Maria T. Cogger, Esther E. Crawford, Katherine F. Dooley, Catherine I. Farrell, Anna V. Grady, Lora E. Lamb, Agnes J. Martin, Lydia E. Miller, Sadie R. Siegel	10	
	—	36
KINDERGARTENS.— Teachers.— Number entitled to		6
Now serving on tenure		6

BOWDITCH DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922,— 38 in an open-air class; 844 in Grades I to VI; 194 in Grades VII and VIII.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,065
TEACHERS.— Entitled to 26 grade teachers, and 1 teacher of an open-air class		27
Now serving on tenure	22	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Gladys M. Parker	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Dorothy M. Burnham, M. F. Martina McDonald, Gertrude C. Roemer	3	
	—	26
KINDERGARTENS.— Teachers.— Number entitled to		4
Now serving on tenure	2	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Irene M. Foster, Grace F. Sullivan	2	
	—	4

BOWDOIN DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922— 49 in special classes; 52 in special English classes; 122 in open-air classes; 430 in Grades I to VI; 149 in Grades VII and VIII.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		765
TEACHERS.— Entitled to 14 grade teachers, 3 teachers of special classes, 1 teacher of a special English class, and 4 teachers of open-air classes		22
Now serving on tenure	14	
Appointed: *To serve during the pleasure of the School Committee.*— Assistants, Dora L. Lombard, Rose E. Segal	2	
Appointed: *To serve for the term ending August 31, 1923.*— Master's Assistant, Zelpha L. Thayer; Assistants, Willa M. Ashton, Mary J. Boyhan, Mary J. Deegan	4	
	—	20
KINDERGARTENS.— Teachers.— Number entitled to		5
Now serving on tenure	3	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Anastasia C. McCarthy	1	
	—	4

CHAPMAN DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922 — 19 in a special class; 954 in Grades I to VI; 256 in Grades VII and VIII.

Average number of pupils belonging for the period September 1, 1921 to April 1, 1922		1,210

TEACHERS.— Entitled to 30 grade teachers and 1 teacher of a special class		31
Now serving on tenure	22	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Regina G. O'Connor	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Florence C. Cunningham, Henrietta G. Hogan, Pauline C. Luppold, Jessie C. McPhee, Rose E. Philbin	5	
	—	28
KINDERGARTENS.— Teachers.— Number entitled to		4
Now serving on tenure	2	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Mary H. Crotty, Madeline C. Hayes	2	
	—	4

CHARLES SUMNER DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922 — 735 in Grades I to VI 239 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		956
TEACHERS.— Entitled to 24 grade teachers		24
Now serving on tenure	22	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Helen L. Clausmeyer, A. Margaret Fallon	2	
	—	24
KINDERGARTENS.— Teachers.— Number entitled to		5
Now serving on tenure	3	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Marion E. Kelley	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Mary G. McCaffrey	1	
	—	5

CHRISTOPHER GIBSON DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 663 in Grades I to VI; 341 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		996
TEACHERS.— Entitled to 25 grade teachers		25
Now serving on tenure	20	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Anna E. Appel, Agnes J. Boland, Winnifred A. Golden, Catherine F. Mulligan	4	
	—	24
KINDERGARTENS.— Teachers.— Number entitled to		2
Now serving on tenure	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Pauline Miller	1	
	—	2

DEARBORN DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922,— 17 in a special class; 43 in a special English class, 101 in prevocational classes; 1,491 in Grades I to VI; 271 in Grades VII and VIII.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,895
TEACHERS.— Entitled to 44 grade teachers, 1 teacher of a special class, 1 teacher of a special English class, 3 teachers of prevocational classes		49
Now serving on tenure	32	
Appointed: *To serve during the pleasure of the School Committee.*— First Assistant in Charge, Martha A. Norton; Assistant, Elizabeth A. Crowley	2	
Appointed: *To serve for the term ending August 31, 1923.*— Prevocational Assistant, Louise Macdonald; Assistants, Mary A. Campbell, Alice C. Coleman, Helen F. Denehy, Annie M. Ducey, Margaret A. Johnson, Helen M. Lally, Marguerite F. Maloney, Florence R. Murphy, Eleanor A. Parker, Alice A. C. Rebane	11	
	—	45
KINDERGARTENS.— Teachers.— Number entitled to		4
Now serving on tenure	2	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Frances R. Kent	1	
	—	3

DILLAWAY DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922,— 32 in special classes; 956 in Grades I to VI; 222 in Grades VII and VIII.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,168
TEACHERS.— Entitled to 29 grade teachers, and 2 teachers of special classes		31
Now serving on tenure	20	
Appointed: *To serve during the pleasure of the School Committee.*— First Assistant in Charge, Sarah J Fallon	1	
Appointed: *To serve for the term ending August 31, 1923.*— Master's Assistant, M. Edith Cole; First Assistant in Charge, Elizabeth M. Finneran; Assistants, Katherine C. Burns, Mary B. Doherty, Theresa V. Donahue, Helen R. Pengilly,	6	
	—	27
KINDERGARTENS.— Teachers.— Number entitled to		5
Now serving on tenure	2	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Catherine M. McCance, Helen Sawyer	2	
	—	4

DUDLEY DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922,— 16 in a special class; 115 in prevocational classes; 12 in a class for the conservation of eyesight; 893 in Grades I to VI; 265 in Grades VII and VIII.		1
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,135
TEACHERS.— Entitled to 29 grade teachers, 1 teacher of a special class, 4 teachers of prevocational classes, 1 teacher of a class for the conservation of eyesight		35
Now serving on tenure	20	
Appointed: *To serve for the term ending August 31, 1923.*— First Assistants in Charge, Mary A. McCarthy, Grace L. Pomeroy; Assistants, Helen K. Burke, Sarah E. Cohen, Ruth E. Reynolds, Sabina M. Ryan	6	
	—	26
KINDERGARTENS.— Teachers.— Number entitled to		4
Now serving on tenure	3	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Bertha A. McPherson	1	
	—	4

DWIGHT DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922,— 22 in an ungraded class; 83 in special classes; 26 in an open-air class; 557 in Grades I to VI; 180 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		894
TEACHERS.— Entitled to 18 grade teachers, 1 teacher of an ungraded class; 5 teachers of special classes, and 1 teacher of an open-air class		25
Now serving on tenure	14	
Appointed: *To serve for the term ending August 31, 1923.*— Submaster, Francis J. Driscoll; Instructors, Special classes, Alice S. Kenyon, Edythe M. McKelligett, Esther P. Thumim; Assistants, Anna V. Curran, James F. Drey, Caroline McAloon McHugh, Blanche Young	8	
	—	22
KINDERGARTENS.— Teachers.— Number entitled to		2
Now serving on tenure	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Eleanor G. McGrath	1	
	—	2

EDMUND P. TILESTON DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 41 in hospital classes; 661 in Grades I to VI; 152 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		827

TEACHERS.— Entitled to 20 grade teachers, and 3 teachers of hospital classes		23
Now serving on tenure	13	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Madge G. Ross	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Louise M. Borre, Edna S. Evans, Mary Flynn, Viola W. Hume, Agnes E. Kelley, Lena Seitlin	6	
	—	20
KINDERGARTENS.— Teachers.— Number entitled to		4
Now serving on tenure	2	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Esther R. Thurman	1	
	—	3

EDWARD EVERETT DSITRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 14 in a special class; 1,217 in Grades I to VI; 310 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,522
TEACHERS.— Entitled to 38 grade teachers, and 1 teacher of a special class		39
Now serving on tenure	29	
Appointed: *To serve during the pleasure of the School Committee.*— Assistants, Margaret M. Giblin, Mary O. Nolan	2	
Appointed: *To serve for the term ending August 31, 1923.*— Master's Assistant, Carrie M. Schroeder; Assistants, Madeline M. Ellis, Agnes P. Goggin, Helen M. Little, Gertrude J. Rhilinger, Rosalie C. Simpson, Marguerite R. Young	7	
	—	38
KINDERGARTENS.— Teachers.— Number entitled to		4
Now serving on tenure	3	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Adele L. Stern	1	
	—	4

ELIHU GREENWOOD DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 1,017 in Grades I to VI; 304 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,299
TEACHERS.— Entitled to 33 grade teachers		33
Now serving on tenure	19	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Mary M. J. Egar	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Katherine M. Beebe, Nellie K. Bishop, Lillian B. Blackmer, Agnes R. Collier, Emma E. Dvorak, Helen V. Hurley, Daisy I. MacDowell, Barbara M. Murphy, Edith I. Swanson, Clare L. Zimmerman	10	
	—	30

KINDERGARTENS.— Teachers.— Number entitled to . . . 6
Now serving on tenure 4
Appointed: *To serve during the pleasure of the School Committee.*— First Assistant, Isabel C. French 1
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Marie A. Gordon 1
— 6

ELIOT DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 95 in ungraded classes; 45 in special classes; 145 in special English classes; 52 in prevocational classes; 2,189 in Grades I to VI; 275 in Grades VII and VIII.
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922 2,779
TEACHERS.— Entitled to 61 grade teachers; 3 teachers of ungraded classes; 3 teachers of special classes; 5 teachers of special English classes; 2 teachers of prevocational classes . 74
Now serving on tenure 35
Appointed: *To serve during the pleasure of the School Committee.*— First Assistant in Charge, Catherine J. Cunningham; Assistants, Mary A. E. Connolly, Grace F. Laughlin, Alice McNally, Frances S. Rodgers 5
Appointed: *To serve for the term ending August 31, 1923.*— Sub-master, William S. Lenihan; Assistants, Ethel L. Burke, Margaret A. Canney, Louise F. Carangelo, Marion A. Cotter, Bessie F. Cummins, Mildred A. Dacey, Mary A. Dunbar, Mary O. Duvall, Anna I. Farrell, Gertrude S. Feeley, Helen V. Gill, Mary V. Kane, Irene E. Kiely, Joanna M. Kilmain, Mary E. Lawlor, Mary M. Lombard, Helen E. Maxwell, Elizabeth M. McCrann, Margaret M. McHugh, Mary M. Monaghan, Esther R. Noone, Rose Riley, Marion L. Scannell, Marguerite A. Wiles 25
— 65
KINDERGARTENS.— Teachers.— Number entitled to . . . 4
Now serving on tenure 4

EMERSON DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 1,150 in Grades I to VI; 239 in Grades VII and VIII; and 96 in Grade IX.
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922 1,452
TEACHERS.— Entitled to 36 grade teachers 36
Now serving on tenure 26
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Mary B. Flynn 1
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Edna M. Lane, Catherine F. Murphy, Grace M. Toland, Margery Viles 4
— 31

KINDERGARTENS.— Teachers.— Number entitled to . . .		5
Now serving on tenure	3	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Phyllis L. Macpherson	1	
	—	4

EVERETT DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 18 in a special class; 728 in Grades I to VI; 147 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		877
TEACHERS.— Entitled to 22 grade teachers and 1 teacher of a special class		23
Now serving on tenure	13	
Appointed: *To serve for the term ending August 31, 1923.*— Instructor, special class, Ida H. Rogers; Assistants, Madeline Eich, Dorothy S. Glover, Helen D. Hart, Agnes M. Long, Mary J. O'Day	6	
	—	19
KINDERGARTENS.— Teachers.— Number entitled to . . .		2
Now serving on tenure	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Helen R. Dyer	1	
	—	2

FRANCIS PARKMAN DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 577 in Grades I to VI; 155 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		711
TEACHERS.— Entitled to 18 grade teachers		18
Now serving on tenure	7	
Appointed: *To serve during the pleasure of the School Committee.*— Assistants, Helen C. Conway, Helen R. Jones, Caroline C. Moy	3	
Appointed: *To serve for the term ending August 31, 1923.*— Submaster, Francis A. Duffey; Assistants, Agnes C. Brennan, Leonore F. Davis, Katherine Donahue, Frances M. Holleran, Katherine A. Miller, Mary E. Mulligan	7	
	—	17
KINDERGARTENS.— Teachers.— Number entitled to . . .		4
Now serving on tenure	2	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Honora M. Gorman, Freda R. Muller . . .	2	
	—	4

FRANKLIN DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 16 in a special class; 24 in classes for the conservation of eyesight; 872 in Grades I to VI; 141 in Grades VII and VIII.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,020
TEACHERS.— Entitled to 25 grade teachers, 1 teacher of a special class and 2 teachers of classes for conservation of eyesight		28
Now serving on tenure	20	
Appointed: *To serve for the term ending August 31, 1923.*— Master's Assistant, Ella A. Curtis; Instructor Special Class, Nellie M. Durgin; Assistant, Gertrude R. Gorey	3	
	—	23
KINDERGARTENS.—Teachers.— Number entitled to		5
Now serving on tenure	3	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Mildred E. Parsons	1	
	—	4

FREDERIC W. LINCOLN DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 569 in Grades I to VI; 148 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		704
TEACHERS.— Entitled to 18 grade teachers		18
Now serving on tenure	13	
Appointed: *To serve for the term ending August 31, 1923.*— Submaster, Thomas L. Mea; Assistants, Sarah M. Harkins, Grace M. MacDougall, Margaret M. Stapleton	4	
	—	17
KINDERGARTENS.— Teachers.— Number entitled to		3
Appointed: *To serve for the term ending August 31, 1923.*— First Assistant, Dorothy L. Mitchell; Assistants, Frances B. Damon, Gertrude M. Hughes		3

GASTON DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 785 in Grades I to VI; 209 in Grades VII and VIII; and 69 in Grade IX.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,100
TEACHERS.— Entitled to 27 grade teachers		27
Now serving on tenure	18	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Katherine F. Breen	1	
Appointed: *To serve for the term ending August 31, 1923.*— Master's Assistant, Ona I. Nolan; Assistants, Mary C. Hilton, Ella R. Lyons, Helen D. McHardy, Ida E. Penell, Emma A. Sellew	6	
	—	25
KINDERGARTENS.— Teachers.— Number entitled to		2
Now serving on tenure		2

GEORGE PUTNAM DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April I, 1922,— 34 in special classes; 784 in Grades I to VI; 463 in Grades VII and VIII; and 150 in Grade IX.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922 1,408

TEACHERS.— Entitled to 35 grade teachers, and 2 teachers of special classes 37

Now serving on tenure 28

Appointed: *To serve for the term ending August 31, 1923.*— Assistants, M. Irene Bills, Florence M. Duncan, Mary F Harrington, Lucille H. Kelleher, Margaret L. McNamara, Marguerite M. Patterson, Margaret M. Tuohy . . . 7

— 35

KINDERGARTENS.— Teachers.— Number entitled to . . . 4

Now serving on tenure 2

Appointed: *To serve during the pleasure of the School Committee.*— First Assistant, Alice B. Crosbie 1

— 3

GILBERT STUART DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 568 in Grades I to VI; 162 in Grades VII and VIII.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922 703

TEACHERS.— Entitled to 18 grade teachers 18

Now serving on tenure 13

Appointed: *To serve during the pleasure of the School Committee.*— Assistants, Margaret M. Hayes, Muriel L. Staples . 2

Appointed: *To serve for the term ending August 31, 1923.*— Submaster, James L. Early; Master's Assistant, Mary G. Cahill; Assistant, Bessie I. Breslasky 3

— 18

KINDERGARTENS.— Teachers.— Number entitled to . . . 4

Now serving on tenure 3

HANCOCK DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 65 in ungraded classes; 43 in special classes; 120 in Special English classes; 45 in Prevocational Classes; 118 in open-air classes; 1,709 in Grades I to VI; 252 in Grades VII and VIII; and 65 in Grade IX.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922 2,365

TEACHERS.— Entitled to 51 grade teachers, 2 teachers of ungraded classes; 3 teachers of special classes; 4 teachers of special English classes; 1 teacher of a prevocational class; and 4 teachers of open-air classes 65

Now serving on tenure 33

Appointed: *To serve during the pleasure of the School Committee.*— Master's Assistant, Nina M. Doanan; First Assistant in charge, Isabella J. Ray; Assistants, Loretto R. Kelley, Mary L. Walsh 4

Appointed: *To serve for the term ending August 31, 1923.*— Instructor, Special Class, Bertha M. Druley; Assistants, Mary A. Ahern, Victoria R. Cotichini, Margaret M. Finnegan, Frances Forte, Phyllis E. Geary, Lucie M. Grenier, Nellie J. Hamilton, Marion E. Hines, Mary C. Hopkins, Margaret M. Horgan, Elizabeth L. Maggioni, Marion P. Mahan, Mary R. Mansfield, Gladys M. McKay, Margaret E. McKenna, Rose B. McKenna, Mary W. O'Brien, Dorothy L. Quinn, Marguerite Stetfield, Dorothy M. Tatum, Catherine A. Vanier, Mary M. Welch 23

— 60

KINDERGARTENS.— Teachers.— Number entitled to . . . 16

Now serving on tenure 7

Appointed: *To serve for the term ending August 31, 1923.*— First Assistant, Mildred B. Cleary; Assistants, Lillian Cherry, Mary A. Collins, Ruth G. Dulligan, Lillian H. Herter, Anna M. Kingman, Helen M. Norton, Elise W. Thurston . . 8

— 15

HARVARD-FROTHINGHAM DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 49 in special classes; 11 in a class for conservation of eyesight; 915 in Grades I to VI; 242 in Grades VII and VIII.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922 1,136

TEACHERS.— Entitled to 29 grade teachers; 3 teachers of special classes, and 1 teacher of a class for conservation of eyesight . 33

Now serving on tenure 22

Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Mary C. Falvey 1

Appointed: *To serve for the term ending August 31, 1923.*—Submaster, Robert B. Houghton; Assistants, Mary M. Carroll, Margaret M. Corbett 3

— 26

KINDERGARTENS.— Teachers.— Number entitled to . . . 6

Now serving on tenure 3

Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Christine Brock, Catherine A. Keohane, Selma S. Samuels 3

— 6

HENRY GREW DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 642 in Grades I to VI; 168 in Grades VII and VIII.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922 760

TEACHERS.— Entitled to 20 grade teachers		20
Now serving on tenure	10	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Florence P. Saunders	1	
Appointed: *To serve for the term ending August 31 1923.*— Assistants, Norma I. Bake, Blanche L. Donohoe, Gladys P. Douglass, Anna Kapples, Constance McBride, Louise F. McLaughlin, Agnes L. Miller Antoinette D. Wolejka	8	
	—	19
KINDERGARTENS.— Teachers.— Number entitled to		5
Now serving on tenure	3	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Cornelia R. Hinkley	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Anna M. Flanagan	1	
	—	5

HENRY L. PIERCE DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 14 in a special class; 1,278 in Grades I to VI; 400 in Grades VII and VIII, and 107 in Grade IX.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,768
TEACHERS.— Entitled to 45 grade teachers, and 1 teacher of a special class		46
Now serving on tenure	27	
Appointed: *To serve during the pleasure of the School Committee.*— Sub-master, John J. Connelly; Assistants, Helen A. Barry, Anna M. Buckley, Mary E. Kenelly, Dora Slepian	5	
Appointed: *To serve for the term ending August 31, 1923.*— Instructor, Special Class, Anna G. Cauley; Assistants, Gertrude L. Bacon, Margaret M. Briel, Margaret F. Duffy, Katherine M. Dullea Lorion G. Hallett, Mary Kirby, Kathryn F. Mahoney, H. Ursula Mea, Florence Ridlon, Edith C. Scanlan, Alice L. Sheahan	12	
	—	44
KINDERGARTENS.— Teachers.— Number entitled to		4
Now serving on tenure	2	
Appointed: *To serve for the term ending August 31, 1923.*— Louise DeL. Campbell, Rose B. Greenberg	2	
	—	4

HORACE MANN SCHOOL.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 9 in an ungraded class; 120 in Grades I to VI; 27 in Grades VII and VIII; 8 in Grade IX, and 4 in Grade X.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		163
TEACHERS.— Entitled to 13 grade teachers and 1 teacher of an ungraded class		14

Now serving on tenure	11	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant Principal, Jennie M. Henderson	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Victoria C. Jesseman	1	
	—	13

HUGH O'BRIEN DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 21 in a special class; 1,190 in Grades I to VI; 382 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,568
TEACHERS.— Entitled to 39 grade teachers and 1 teacher of a special class		40
Now serving on tenure	25	
Appointed: *To serve during the pleasure of the School Committee.*— Assistants, Emma A. McDonald, Evelyn L. Murphy, Katharine M. Murphy	3	
Appointed: *To serve for the term ending August 31, 1923.*— Submaster, Valentine F. Dunn; Assistants, Helen L. Doherty, Mary C. Doherty, Agnes G. Kearns, Frederick L. Mahoney, Anna F. Murphy, Mary C. Murphy, Loyola P. Pfeffer	8	
	—	36
KINDERGARTENS.— Teachers.— Number entitled to		6
Now serving on tenure	2	
Appointed: *To serve during the pleasure of the School Committee.*— First Assistant, Helen A. Melia	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Mary A. Galligan, Alice G. Muldoon	2	
	—	5

HYDE DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 15 in a special class; 64 in prevocational classes; 522 in Grades I to VI; 116 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		705
TEACHERS.— Entitled to 16 grade teachers, 1 teacher of a special class; 2 teachers of prevocational classes		19
Now serving on tenure	14	
Appointed: *To serve for the term ending August 31, 1923.*— Prevocational assistant, Anne Sheridan; Assistants, M. Anne Green, Pauline M. Halpin	3	
	—	17
KINDERGARTENS.— Teachers.— Number entitled to		4
Now serving on tenure	3	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Anna E. Minihan	1	
	—	4

JEFFERSON DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 17 in a special class; 1,077 in Grades I to VI; 277 in Grades VII and VIII.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,344
TEACHERS.— Entitled to 34 grade teachers, and 1 teacher of a special class		35
Now serving on tenure	27	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Eleanor F. Ewing, Louise K. Faul, Clarice H. McIntyre, Judith Prendergast, Elsie V Soelle	5	
	—	32
KINDERGARTENS.— Teachers.— Number entitled to		6
Now serving on tenure	5	
Appointed: *To serve for the term ending Augus 31, 1923.*— Assistant, Ellen P. Colleran	1	
	—	6

JOHN A. ANDREW DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 819 in Grades I to VI; 230 in Grades VII and VIII.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,043
TEACHERS.— Entitled to 26 grade teachers		26
Now serving on tenure	13	
Appointed: *To serve for the term ending August 31, 1923.*— Submaster, John P. McEleney; Assistants, Mary J. Carroll, Katharine A. Collins, Rachel E. Cotton, Dorothy F. Coughlan, Violet C. Goetz, Carolyn B. Hedstrom, Alice F. Magner, Mary E. O'Connor, Mary E. O'Loughlin, Helen F. Reidy	11	
	—	24
KINDERGARTENS.— Teachers.— Number entitled to		2
Now serving on tenure	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Mildred J. Hannon	1	
	—	2

JOHN MARSHALL DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 15 in a special class; 1,262 in Grades I to VI.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,269
TEACHERS.— Entitled to 31 grade teachers; 1 teacher of a special class		32
Now serving on tenure	24	
Appointed: *To serve during the pleasure of the School Committee.*— Assistants, Mary M. Facey, Anna M. Galvin, Margaret M. J. McAndrew	3	

Appointed: *To serve for the term ending August 31, 1923.*— Master's Assistant, Sarah A. Driscoll; Assistants, Catherine V. Daley, Barbara McIntyre, Bertha A. Mee . . .	4	
	—	31
KINDERGARTENS.— Teachers.— Number entitled to . . .		6
Now serving on tenure	2	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Ruth K. FitzGerald, M. Isabel Sullivan, Helen M Tivnan	3	
	—	5

JOHN WINTHROP DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 17 in a special class; 32 in a special English class; 1,294 in Grades I to VI; 286 in Grades VII and VIII; and 102 in Grades IX.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,778
TEACHERS.— Entitled to 42 grade teachers, 1 teacher of a special class; and 1 teacher of a special English class . .		44
Now serving on tenure	24	
Appointed: *To serve during the pleasure of the School Committee.*— Master's Assistant, Elizabeth W. O'Connor; Assistants, Mildred A. Bamberg, Marjory T. Doherty, Margherita R. Milliken, Selma S. Stern	5	
Appointed: *To serve for the term ending August 31, 1923.*— First Assistant in Charge, Anna J. O'Brien; Instructor, Special Class, Mary H. Keefe; Assistants, Marie F. Daunt, Gladys P. Eaton, Agnes M. Leavey, Ellen V. McLaughlin, Alice Pike, Pauline A. Prendergast, Marguerite G. Sullivan, Helen M, Tanck, Mary F. Tierney	11	
	—	40
KINDERGARTENS.— Teachers.— Number entitled to . . .		4
Now serving on tenure		3

JULIA WARD HOWE DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 16 in a special class; 1,060 in Grades I to VI.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,063
TEACHERS.— Entitled to 26 grade teachers and 1 teacher of a special class		27
Now serving on tenure	15	
Appointed: *To serve during the pleasure of the School Committee.*— Assistants, Marion Goldstein, Helen I. Mulliken,	2	
Appointed: *To serve for the term ending August 31, 1923.*— Instructor, Special Class, Frances E. Taylor; Assistants, Cecelia F. Doherty, Ellen A. Dwyer, Marion E. Gallagher, Margaret M. Joyce, Mary V. O'Neill, Theresa A. O Reilly, Katherine M. Stroup, Helen R. Tobin	9	
	—	26

KINDERGARTENS.— Teachers.— Number entitled to		2
Now serving on tenure	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Marguerita R. Foley	1	
	—	2

LAWRENCE DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 15 in a special class; 73 in prevocational classes; 675 in Grades I to VI; 118 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		870
TEACHERS.— Entitled to 20 grade teachers; 1 teacher of a special class; 2 teachers of prevocational classes		23
Now serving on tenure	13	
Appointed: *To serve for the term ending August 31, 1923.*— First Assistant in Charge, Eva C. Morris; Instructor, Special Class, Anastasia L. McAvoy; Assistants, Julia V. Foley, Mary A. Kelley, Nora A. Mehigan, C. Louise Shea, Margaret M. Welch	7	
	—	20
KINDERGARTENS.— Teachers.— Number entitled to		1
Now serving on tenure	1	

LEWIS DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 835 in Grades I to VI; 529 in Grades VII and VIII, and 226 in Grade IX.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,580
TEACHERS.— Entitled to 40 grade teachers		40
Now serving on tenure	22	
Appointed: *To serve during the pleasure of the School Committee.*— Assistants, Mary M. Byrne, Mary M. Callahan, Louise J. Chambers, Helen T. Cullen, Helen T. Hannon, Margaret E. Maloney	6	
Appointed: *To serve for the term ending August 31, 1923.*— First Assistant in Charge, Celia V. Leen; Assistants, Helen M. Corrigan, Ruth V. Doyle, Vera K. Flaherty, Mary I. Foley, Rose M. Hickey, Helen M. Lack, Rose A. Lewis, Helen C. Tobin	9	
	—	37
KINDERGARTENS.— Teachers.— Number entitled to		4
Now serving on tenure	1	
Appointed: *To serve during the pleasure of the School Committee.*— First Assistant, Florence E. Crowninshield; Assistant, Gertrude L. Mazur	2	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Hester C. Davis	1	
	—	4

LONGFELLOW DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 13 in a special class; 999 in Grades I to VI; 283 in Grades VII and VIII.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,276
TEACHERS.— Entitled to 32 grade teachers, and 1 teacher of a special class		33
Now serving on tenure	23	
Appointed: *To serve during the pleasure of the School Committee.*— Assistants, Katharine M. Copithorne, Mary O. Mackey, Helen G. Morgan	3	
Appointed: *To serve for the term ending August 31, 1923.*— Instructor, Special Class, Mary A. Hartigan; Assistants, Ellen A. Cochrane, Virginia McKillop, Gertrude C. Mellen, Helen B. Mendall	5	
	—	31
KINDERGARTENS.— Teachers.— Number entitled to		4
Now serving on tenure	2	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Josephine McCarthy	1	
	—	3

LOWELL DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 29 in special classes; 26 in an open-air class; 820 in Grades I to VI; 253 in Grades VII and VIII.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,107
TEACHERS.— Entitled to 27 grade teachers; 2 teachers of special classes, and 1 teacher of an open-air class		30
Now serving on tenure	20	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Mary E. Loughman	1	
Appointed: *To serve for the term ending August 31, 1923.*— Master's Assistant, Lucy H. Littlefield; Instructors, Special Classes, Mildred A. Bradley, Gerardine A. Hagerty; Assistants, Esther L. Dalrymple, Florence Hurwitz, Helen G. Keefe, Elizabeth M. Merz	7	
	—	28
KINDERGARTENS.— Teachers.— Number entitled to		4
Now serving on tenure	2	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Charlotte A. Ferry, Mary C. Turnbull	2	
	—	4

MARTIN DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 12 in a class for conservation of eyesight; 429 in Grades I to VI; 126 in Grades VII and VIII.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		548
TEACHERS.— Entitled to 14 grade teachers, and 1 teacher of a class for the conservation of eyesight		15
Now serving on tenure		14
KINDERGARTENS.— Teachers.— Number entitled to		4
Now serving on tenure	3	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Winnifred M. McEvoy	1	
	—	4

MARY HEMENWAY DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 1,610 in Grades I to VI; 415 in Grades VII and VIII, and 160 in Grade IX.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		2,149
TEACHERS — Entitled to 54 grade teaches		54
Now serving on tenure	31	
Appointed: *To serve during the pleasure of the School Committee* — Assistants, Louise F. Barry, Madeline F. Goodale, Ellen C. Hennessey, Bridget C. Ridge	4	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Annie F. Barry, Agnes G. Brennan, Ruth I. Byrne, Gladys M. Carnegie, Alice L. Carroll, Margaret R. Durant, Winifred A. Fohlin, Agnes M. Golden, Marjorie F. Keating, Louise E Mooney, Grace A. Murray, Katherine E. Newell, May A. O'Brien, Helen Rosnosky, Bessie Walden	15	
	—	50
KINDERGARTENS.— Teachers.— Number entitled to		6
Now serving on tenure	3	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Olivia F. O'Donnell, Consuelo S. Sedley, Rita M. Sherry	3	
	—	6

MATHER DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 18 in a special class; 129 in prevocational classes; 1,906 in Grades I to VI; 497 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		2,503
TEACHERS.— Entitled to 60 grade teachers; 1 teacher of a special class, and 4 teachers of prevocational classes		65
Now serving on tenure	41	
Appointed: *To serve during the pleasure of the School Committee.*— Instructor, Special Class, Linna M. Ferrer; Assistant, Mary M. Cronin	2	

Appointed: *To serve for the term ending August 31, 1923.*— Submaster, Frederick A. Dunfey; Assistants, Margaret M. Cronin; Winifred M. Doyle, Elsie M. Eckman, Bertha F. Gavin, Annie E. Mahoney, Evelyn H. Manley, Helen H. McBurney, Anne E. McCoy, Rose M. McDonough, Mary F. Nolan, Edith G. Peterson, Marion E. Rafferty, Elizabeth F. Sarjeant, Winifred I. Swallow, Idabel N. Thureson, Marion Turner 17
— 60

KINDERGARTENS.— Teachers.— Number entitled to . . . 8
Now serving on tenure 5
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Mary R. Gray, Jessie E. Small 2
— 7

MINOT DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 420 in Grades I to VI; 152 in Grades VII and VIII.
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922 560
TEACHERS.— Entitled to 14 grade teachers 14
Now serving on tenure 11
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Katherine Moran 1
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Cecelia G. Norton 1
— 13

KINDERGARTENS.— Teachers.— Number entitled to . . . 2
Now serving on tenure 1
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Emily F. McLaughlin 1
— 2

NORCROSS DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 15 in a special class; 31 in a special English class; 88 in open-air classes; 12 in a class for conservation of eyesight; 681 in Grades I to VI; 182 in Grades VII and VIII.
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922 989
TEACHERS.— Entitled to 21 grade teachers; 1 teacher of a special class; 1 teacher of a special English class; 3 teachers of open-air classes, and 1 teacher of a class for conservation of eyesight 27
Now serving on tenure 21
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Dorothy M. Best, Minnie G. Feeley, Mary K. Grass, Sophie M. Hess, Helen V. Weissbach 5
— 26

KINDERGARTENS.— Teachers.— Number entitled to		4
Now serving on tenure	2	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Ruth A. Bulger, Mildred A. Horne	2	
	—	4

OLIVER HAZARD PERRY DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 6 in Spectacle Island school; 15 in a special class; 584 in Grades I to VI, and 186 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		785
TEACHERS.— Entitled to 19 grade teachers; 1 teacher at Spectacle Island School; and 1 teacher of a special class;		21
Now serving on tenure	17	
Appointed: *To serve during the pleasure of the School Committee.*— Master's Assistant, Margaret A. Nichols	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Marie C. MacGrath, Margaret P. O'Leary	2	
	—	20
KINDERGARTENS.— Teachers.— Number entitled to		2
Now serving on tenure	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Florence N. Creed	1	
	—	2

OLIVER WENDELL HOLMES INTERMEDIATE DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 775 in Grades VII and VIII, and 285 in Grade IX.	
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922	1,050
TEACHERS.— Entitled to 27 grade teachers	27
Now serving on tenure	27

PHILLIPS BROOKS DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 17 in a special class; 30 in a special English class; 60 in rapid advancement classes; 1,230 in Grades I to VI; and 328 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,526
TEACHERS.— Entitled to 39 grade teachers; 1 teacher of a special class; 1 teacher of a special English class; 2 teachers of rapid advancement classes		43
Now serving on tenure	21	
Appointed: *To serve during the pleasure of the School Committee.*— Assistants, Adelaide R. Burke, Minnie Colitz, Nelly G. Fannon	3	

Appointed: *To serve for the term ending August 31, 1923.*— Instructor, Special Class, Harriet E. Gage; Assistants, Jessie L. Barth, Stella A. Cannon, Anna E. Dawley, Alice E. Donoghue, Mary R. Greeley, Gertrude Jacobs, Mary L. McNamara, Helen M. C. Mullen, Frances M. Murphy, Helen A. Murphy, Sara Rice, Anna E. Scully . . . 13 — 37

KINDERGARTENS.— Teachers.— Number entitled to . . . 8

Now serving on tenure 4

Appointed: *To serve during the pleasure of the School Committee.*— First Assistant, Alice L. Linnehan 1

Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Dorothy M. Robinson, Louise V. Tivnan, Goldie G. West . . . . . 3 — 8

PRESCOTT DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 16 in a special class; 73 in prevocational classes; 538 in Grades I to VI and 117 in Grades VII and VIII.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922 722

TEACHERS.— Entitled to 16 grade teachers, 1 teacher of a special class; 2 teachers of prevocational classes . . . 19

Now serving on tenure 11

Appointed: *To serve for the term ending August 31, 1923.*— First Assistant in Charge, Teresa L. Carlin; prevocational Assistant, Mary C. Culhane; Instructor, Special Class, Ellen C. Golden; Assistants, Alice W. Collins, Julia E. Hegarty, Frances E. McColgan, Mary E. Shea . . . . . 7 — 18

KINDERGARTENS.— Teachers.— Number entitled to . . . 2

Now serving on tenure 1

Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Alice E. Oliver . . . . . 1 — 2

PRINCE DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 767 in Grades I to VI; 219 in Grades VII and VIII.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922 967

TEACHERS.— Entitled to 24 grade teachers 24

Now serving on tenure 17

Appointed: *To serve during the pleasure of the School Committee.*— Assistants, Constance Bisbee, Vera A. Kingsford, 2

Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Alice R. Belger, Mary E. D. Devereaux, Marion A. Fields, Marion M. Payzant, Mae B. Reynolds. . . 5 — 24

KINDERGARTENS.— Teachers.— Number entitled to . . .		2
Now serving on tenure	1	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Marion E. Godfrey	1	
	—	2

QUINCY DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 27 in an ungraded class; 30 in special classes; 54 in special English classes; 99 in prevocational classes; 88 in open-air classes; 619 in Grades I to VI; and 128 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,037
TEACHERS.— Entitled to 18 grade teachers, 1 teacher of an ungraded class; 2 teachers of special classes; 2 teachers of special English classes; 3 teachers of prevocational classes; 3 teachers of open-air classes		29
Now serving on tenure	19	
Appointed: *To serve during the pleasure of the School Committee.*— Instructor, special class, Helen F. Cummings . .	1	
Appointed: *To serve for the term ending August 31, 1923.*— Instructor, Special Class, Grace H. K. Jarvis; Assistants, Jane U. Barry, Margaret E. Gallagher, Mary A. Geary, Eva Green, Caroline M. Kelley, Agnes M. McNamara, Judith M. Oliva, Lillian Pierce Silvester	9	
	—	29
KINDERGARTENS.— Teachers.— Number entitled to . . .		7
Now serving on tenure	4	
First Assistant, Fannie B. Hayden; Assistant, Frances E. O'Neill	2	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Catherine E. Miley, Marion E. Puttner . .	2	
	—	8

RICE DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 773 in Grades I to VI, and 240 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		962
TEACHERS.— Entitled to 25 grade teachers		25
Now serving on tenure	15	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Kathleen G. Tobin	1	
Appointed: *To serve for the term ending August 31, 1923.*— Submaster, Philip J. Bond; Assistants, Jane E. Brooks, Elizabeth V. Donahoe, Eva Gordon, Anna C. Hughes, Mary B. Kirby, Catherine F. McCabe, Helen R. Murphy,	8	
	—	24

KINDERGARTENS.— Teachers.— Number entitled to		2
Now serving on tenure	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Mary A. Kelly	1	
	—	2

ROBERT GOULD SHAW DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 12 in a special class; 1,038 in Grades I to VI; 291 in Grades VII and VIII, and 99 in Grade IX.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,410
TEACHERS.— Entitled to 36 grade teachers and 1 teacher of a special class		37
Now serving on tenure	22	
Appointed: *To serve during the pleasure of the School Committee.*— First Assistant in charge, Anna L. Maguire; Assistants, Marion B. D. Curley, Margaret F. Murray	3	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Mary T. Beahan, Marguerite G. Crowley, Julia A Driscoll, Grace J. A. Driscoll, Alice C. English, Margaret M. Moore, Helen E. Sullivan, Ruth V. Watson, Ellen L. Welch	9	
	—	34
KINDERGARTENS.— Teachers.— Number entitled to		5
Now serving on tenure		3

ROGER WOLCOTT DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 16 in a special class; 1,917 in Grades I to VI, and 652 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		2,564
TEACHERS.— Entitled to 64 grade teachers, 1 teacher of a special class		65
Now serving on tenure	42	
Appointed: *To serve during the pleasure of the School Committee.*— Assistants, Rose Arenson, Irene E. Cox, Dorothy Kalker	3	
Appointed: *To serve for the term ending August 31, 1923.*— Instructor, Special Class, Beulah O. Berry; Assistants, Eva V. Adelson, Hilda L. Anderson, Susan B. Barker, Julia A. Barrett, Genevieve C. Grass, Marion T. Hughes, Dorothy D. Johnson, Celia Levinson, Grace M. May, Margaret McDonald, Frances B. Mea, Marion B. Mooney, Elizabeth J. Moynahan, Gertrude M. Rooney, Mary A. Searle, Margaret P. Sullivan	17	
	—	62

KINDERGARTENS.— Teachers.— Number entitled to . . .		11
Now serving on tenure	6	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Mary E. Norton	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Lucy E. McCarthy, Mary Miley, Irene O. Mulrey	3	
	—	10

SAMUEL ADAMS DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 15 in a special class; 2,353 in Grades I to VI; 372 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		2,698
TEACHERS.— Entitled to 68 grade teachers, 1 teacher of a special class		69
Now serving on tenure	33	
Appointed: *To serve during the pleasure of the School Committee.*— Assistants, Jeannette Ascolillo, Mary E. Driscoll .	2	
Appointed: *To serve for the term ending August 31, 1923.*— Submaster, John J. Mahoney; First Assistant Grammar, Clarissa E. Prouty; Assistants, Elinor G. Cowan, Rebecca E. Daniels, Grace C. Doherty, Margaret Duggan, A. Louise Facey, Marie D. Forrester, Mary L. Gallagher, Josephine B. Gilson, Katharine G. Harrington, Kathryn M. Hubbard, Frances W. Kelley, J. Irene E. Kelley, Katherine G. Kelley, Ellen A. Leahy, Mary A. Loschi, Frances K. Moriarty, Mildred M. Roe, Esther M. Ryan, Ruth A. Sharkey, Margaret J. Shea, Isabel F. Sullivan	23	
	—	58
KINDERGARTENS.— Teachers.— Number entitled to . . .		12
Now serving on tenure	8	
Appointed: *To serve during the pleasure of the School Committee.*— First Assistant, Grace E. Manson; Assistant, Gladys L. Brown	2	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Sarah G. Maguire	1	
	—	11

SHERWIN DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 132 in special classes; 67 in prevocational classes; 605 in Grades I to VI; 96 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		876
TEACHERS.— Entitled to 17 grade teachers; 9 teachers of special classes, and 2 teachers of prevocational classes . . .		28
Now serving on tenure	22	

Appointed: *To serve during the pleasure of the School Committee.*— Submaster, William P. McDonough; Instructor, Special Class, Anna E. Murphy	2	
Appointed: *To serve for the term ending August 31, 1923.*— Instructors, Special Classes, Katherine A. Kenney, Mary E. Ledger, Florence Rice	3	
	—	27
KINDERGARTENS.— Teachers.— Number entitled to		1
Now serving on tenure		1

SHURTLEFF DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 27 in an ungraded class; 719 in Grades I to VI; 154 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		854
TEACHERS.— Entitled to 22 grade teachers, 1 teacher of an ungraded class		23
Now serving on tenure	13	
Appointed: *To serve during the pleasure of the School Committee.*— Assistants, Marie C. Reardon, Anastasia K. White,	2	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Marion L. Bartick, Margaret L. Collins, Mary B. Cummings, Mary E. Donovan, Muriel G. Gillis	5	
	—	20
KINDERGARTENS.— Teachers.— Number entitled to		4
Now serving on tenure	1	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Adelaide W. Andrews	1	
	—	2

THEODORE LYMAN DISTRICT.

ELEMEMTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 15 in a special class; 31 in a special English class; 199 in prevocational classes; 1,207 in Grades I to VI; and 166 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,589
TEACHERS.— Entitled to 34 grade teachers; 1 teacher of a special class; 1 teacher of a special English class; and 6 teachers of prevocational classes		42
Now serving on tenure	23	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Lillian R. Burke	1	
Appointed: *To serve for the term ending August 31, 1923.*— Submaster, Ernest W. Anderson; Prevocational Assistants, Sarah N. Boyce, Mildred E. Frazier, Helen J. Roberts: Assitants, Bernice M. Bowler, Marion A. Burnham, Helen M. Dooley, Ethel M. Kelly, Margaret H. Kenney, Marie T. McNamara, Kathryn V. Riley, Nellie W. Riley	12	
	—	36

KINDERGARTENS.— Teachers.— Number entitled to . . .		8
Now serving on tenure	4	
Appointed: *To serve during the pleasure of the School Committee.*— First Assistant, Marjorie G. Short	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Marguerite L. Leonard, Bertha K. Rice, Dorothy Sanger	3	
	—	8

THOMAS GARDNER DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonglng between September 1, 1921, and April 1, 1922.— 17 in a special class, 1,158 in Grades I to VI; 249 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,276
TEACHERS.— Entitled to 35 grade teachers and 1 teacher of a special class		36
Now serving on tenure	22	
Appointed: *To serve for the term ending August 31, 1923.*— Submasters, Joseph F. Burch, James E. Dolan; First Assistant in Charge, Annie L. Ziersch; Instructor, Special Class, Maria E. Rick; Assistants, Rosemary R. Carr, Catherine R. Day, Marie C. Doherty, Irene E. Hutchings, Marion B. Morrison, Helen W. Mosher, Margareta M. Muldoon, Evelyn A. Nugent, Lizzie M. Piper	13	
	—	35
KINDERGARTENS.— Teachers.— Number entitled to . . .		6
Now serving on tenure	4	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Helen M. Sughrue	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Elizabeth McGinty	1	
	—	6

THOMAS N. HART DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 15 in a special class; 822 in Grades I to VI; 227 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,056
TEACHERS.— Entitled to 26 grade teachers; 1 teacher of a special class		27
Now serving on tenure	22	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Katherine L. Colbert, A. Theresa Skierski, Edith E. Toland	3	
	—	25
KINDERGARTENS.— Teachers.— Number entitled to . .		4
Now serving on tenure	2	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Alice H. Baker, Jennie A. Gorman . . .	2	
	—	4

ULYSSES S. GRANT DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 18 in a special class; 49 in Special English Classes; 1,109 in Grades I to VI; 212 in Grades VII and VIII; and 86 in Grade IX.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,469
TEACHERS.— Entitled to 35 grade teachers, 1 teacher of a special class, 2 teachers of special English classes		38
Now serving on tenure	22	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Ethel F. Love	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Cecilia A. Bergin, Catherine E. Craig, Mabel O. Dolan, Dora Kalish, Grace V. Lynch, Margaret M. McGowan, Anna G. Riordan, Dorothy Rosenauer, Elizabeth G. Savage, Catherine R. Sullivan, Mary J. Sullivan, Katherine Vernon	12	
	—	35
KINDERGARTENS.— Teachers.— Number entitled to		7
Now serving on tenure	2	
Appointed: *To serve during the pleasure of the School Committee.*— First Assistant, Ruth B. Todd; Assistant, Muriel E. Lowell	2	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Irene H. Norris, Helen I. Thompson	2	
	—	6

WARREN–BUNKER HILL DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 33 in special classes; 1,272 in Grades I to VI; and 338 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,611
TEACHERS.— Entitled to 40 grade teachers, 2 teachers of special classes		42
Now serving on tenure	34	
Appointed: *To serve during the pleasure of the School Committee.*— Instructor, Special Class, Margaret McCrillis; Assistant, Sarah M. Logue	2	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Theresa H. Aiken, Mabel I. Cormack, Bernadette U. Driscoll, Mary L. Geary, Mary I. Tierney	5	
	—	41
KINDERGARTENS.— Teachers.— Number entitled to		5
Now serving on tenure	4	
Appointed: *To serve during the pleasure of the School Committee.*— First Assistant, M. Bernadette Riley	1	
	—	5

WASHINGTON DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 33 in special classes; 60 in open-air classes; 1,329 in Grades I to VI; and 253 in Grades VII and VIII.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,649
TEACHERS.— Entitled to 39 grade teachers, 2 teachers of special classes, 2 teachers of open-air classes		43
Now serving on tenure	29	
Appointed: *To serve during the pleasure of the School Committee.*— Instructor, Special Class, Jessie M. Baker; Assistants, Alice E. Gibbons, Mary E. Haggerty, Catherine G. McCool, M. Frances McNellis	5	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Agnes F. Cullen, C. Frances Doherty, Frances I. Gallagher, Madeline A. Knodell, Daisy Pokroisky, Alice K. Schulenkorf, Mary G. Sullivan	7	
	—	41
KINDERGARTENS.— Teachers.— Number entitled to		6
Now serving on tenure	4	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Mildred C. Goode, Florence E. Johnson	2	
	—	6

WASHINGTON ALLSTON DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 864 in Grades I to VI; 280 in Grades VII and VIII.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		1,115
TEACHERS.— Entitled to 28 grade teachers		28
Now serving on tenure	21	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Jane V. Gearon	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Esther L. Carley, Mary F. Finan, Mary G. Hughes, Ruth G. Hunt, A. Isabelle Timmins	5	
	—	27
KINDERGARTENS.— Teachers.— Number entitled to		4
Now serving on tenure	2	
Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Isabel Olney	1	
	—	3

WELLS DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 47 in special classes; 69 in special English classes; 88 in open-air classes; 10 in a class for the conservation of eyesight; 1,774 in Grades I to VI, and 289 in Grades VII and VIII.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922 1,801

TEACHERS.— Entitled to 51 grade teachers; 3 teachers of special classes; 2 teachers of special English classes; 3 teachers of open-air classes, and 1 teacher of a class for conservation of eyesight 60

Now serving on tenure 30

Appointed: *To serve during the pleasure of the School Committee.*— Master's Assistant, Mary F. McMorrow; First Assistant in Charge, Jeannette A. Nelson 2

Appointed: *To serve for the term ending August 31, 1923.*— First Assistant, Grammar, Ella J. Boyle; Instructor, Special Class, Elizabeth P. Wright; Assistants, Hazel C. Brady, Ida Burgin, Marion Daniels, Mary T. Dowling, Marion E. Duggan, Margaret L. Flanagan, Helen J. McCarthy, Ida Mondlick, Gertrude E. Schnurr, Charlotte M. White . . 12

— 44

KINDERGARTENS.— Teachers.— Number entitled to . . . 8

Now serving on tenure 6

Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Elizabeth A. Millerick 1

— 7

WENDELL PHILLIPS DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 91 in special classes, 48 in a special English class; 30 in an open-air class; 832 in Grades I to VI, and 381 in Grades VII and VIII.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922 1,360

TEACHERS.— Entitled to 30 grade teachers; 6 teachers of special classes; 1 teacher of a special English class, and 1 teacher of an open-air class 38

Now serving on tenure 27

Appointed: *To serve during the pleasure of the School Committee.*— Instructor, Special Class, Frances E. Webster; Assistant, Minnie Silverman 2

Appointed: *To serve for the term ending August 31, 1923.*— Submaster, John L. Mayer; Instructor, Special Class, Lucy A. FitzGerald; Assistants, Henrietta Herthel, Marjorie E. Jacobs, Elizabeth Ross 5

— 34

KINDERGARTENS.— Teachers.— Number entitled to . . . 2

Now serving on tenure 1

Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Eva A. Sanger 1

— 2

WILLIAM E. ENDICOTT DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 32 in an ungraded class; 15 in a special class; and 2,155 in Grades I to VI.

Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		2,134
TEACHERS.— Entitled to 54 grade teachers; 1 teacher of an ungraded class; 1 teacher of a special class		56
Now serving on tenure	29	
Appointed: *To serve during the pleasure of the School Committee.*— Assistants, Jennie F. Boles, Alice L. Gannon, Grace W. Gormley, Regina Hearn, Pauline F. Miley	5	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Annie S. Belinsky, Anna R. Berkovitz, Margaret M. Corcoran, Rose L. Donohoe, Marion I. Evans, Mary A. Gallivan, Marion R. Graham, M. Carmelita Kavanagh, Frances Krinsky, Helen R. Leary, Marion Leary, Alice M. Long, Mary E. Milliken, Marie Mullins, Dorothy M. O'Brien, Alice G. Price, Margaret Smyth	17	
	—	51
KINDERGARTENS.— Teachers.— Number entitled to		14
Now serving on tenure	5	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Maria L. Whittredge	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Eloise K. Cauley, Margaret M. Donahue, Ellen C. Reardon, Gertrude L. Sullivan, Helen Weisman	5	
	—	11

WILLIAM E. RUSSELL DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 15 in a special class; 670 in Grades I to VI; 253 in Grades VII and VIII.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		927
TEACHERS.— Entitled to 23 grade teachers, and 1 teacher of a special class		24
Now serving on tenure	21	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Adelina G. Misite, Alice I. Murray	2	
	—	23
KINDERGARTENS.— Teachers.— Number entitled to		4
Now serving on tenure	1	
Appointed: *To serve during the pleasure of the School Committee.*— First Assistant, Mary E. Wadsworth	1	
Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Elizabeth G. Knapp, Barbara E. Sheridan	2	
	—	4

WILLIAM LLOYD GARRISON DISTRICT.

ELEMENTARY GRADES.— Largest number of pupils belonging between September 1, 1921, and April 1, 1922.— 956 in Grades I to VI.		
Average number of pupils belonging for the period September 1, 1921, to April 1, 1922		948

TEACHERS.— Entitled to 24 grade teachers		24
Now serving on tenure	11	
Appointed: *To serve during the pleasure of the School Committee.*— Assistants, Naomi M. Caldwell, B. Hazel Kane.	2	
Appointed: *To serve for the term ending August 31, 1923.*— Submaster, James P. Collins; Assistants, Isabel E. Evanson, Eloise R. FitzGerald, Alice C. Kapples, Helen M. Nolan, Ursula M. Ryan, Mary M. Tierney, Eleanor M. Whelton	8	
	—	21
KINDERGARTENS.— Teachers.— Number entitled to		9
Now serving on tenure	3	
Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Alma C. McKenna	1	
Appointed: *To serve for the term ending August 31, 1923.*— First Assistant, Ida M. Fields; Assistants, Euphemia D. Christie, Mary A. Watson	3	
	—	7

HOUSEHOLD SCIENCE AND ARTS.

COOKERY.

Now serving on tenure	33	
Appointed: *To serve during the pleasure of the School Committee.*— Teachers, Mary M. Giblin, Agnes E. Perkins	2	
Appointed: *To serve for the term ending August 31, 1923.*— Teachers, Helena R. Burke, Dorothy R. Bush, Gertrude A. Foley, Beatrice McGovern, Lucy H. Nash, Irene A. Newton, Muriel T. Preble, Bessie E. Robbins, Mildred E. Shane	9	
	—	44

SEWING.

Now serving on tenure	46	
Appointed: *To serve during the pleasure of the School Committee.*— Teachers, Marie L. Maguire, Mary A. F. Malloy, Margaret H. Sullivan	3	
Appointed: *To serve for the term ending August 31, 1923.*— Teachers, Agnes L. Anderson, Margaret M. Casey, Isabella Cay, Genevieve M. Conroy, Eveline B. Cook, Marion A. Driscoll, Gertrude P. Gordon, Eileen R. Griffin, Jessie Guttentag, Clara K. Hogan, Hester E. Hurlbutt, Grace E. Jones, Adeline H. McCormick, Margaret E. Minton, Josephine G. Stephens, Margaret F. Tivnan	16	
	—	65

MANUAL ARTS.

Now serving on tenure	49	
Appointed: *To serve during the pleasure of the School Committee.*— Shop Foreman, Hugh J. Cox; Shop Instructors, Norman P. Barker, Carl E. Janson, Walter F. Perry, Alden T. Stubbs; Instructors, Shopwork, Edward W. Malone, Frederick E. Rau, Percy R. Stewart, Francis O. Wood, William L. Young	10	

Appointed: *To serve for the term ending August 31, 1923.*— Shop Foreman, Abraham S. Burnes, Warren C. Burnham, Frederick L. Eames, Francis V. Kenney, John Knight, Patrick J. Smith, Orren R. Tarr; Foremen, Shopwork, J. Maynard Cheney, Harold P. Johnson, William E. O'Connor, Arvid J. Wahlstrom; Shop Instructors, Charles M. Doherty, Earl R. Freeman, Chandler T. Jewett, Frank B. Kaulbeck, Charles Laird, Francis J. Lee, Alexander MacGilvray, John J. McCarthy, Patrick J. McGuinness, John D. McLaughlin, Frank L. Ogilvie, Clarence R. Rees, Frank P. Rich, Emil W. Zepp; Instructors, Shopwork, Levi H. Brown, Harold A. Conant, Arthur G. Hamilton, John T. McGee, Harold I. Rippon, Walter E. Shaughnessy, Americo B. Ventura, Instructor in Manual Training, Blanche S. Hall; Assistant Instructor in Manual Training, Marion C. Donelson . . . . . 34 — 93

CONSERVATION OF EYESIGHT CLASSES.

Now serving on tenure 2

Appointed: *To serve for the term ending August 31, 1923.*— Assistant in charge, A. Harriet Haley; Assistants, Eleanor P. Brawley, Cora L. Mulrey . . . . . 3 — 5

SPEECH IMPROVEMENT CLASSES.

Now serving on tenure 4

Appointed: *To serve during the pleasure of the School Committee.*— Assistant, Dora F. Smith 1

Appointed: *To serve for the term ending August 31, 1923.*— Assistants, Helen M. Baker, Grace T. Lonergan, Alice G. Mason, Gertrude M. Reilly, Edith A. West . . . . . 5 — 10

ASSIGNED TEACHER.

Examiner in Penmanship.

Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Ellen S. Bloomfield 1

CONTINUATION SCHOOL.

Appointed: *To serve for the term ending August 31, 1923.*— Heads of Divisions, John J. Boyan, Edward M. McDonough, Esther L. McNellis; Division Foremen, Henry D. Fallona, George E. Hill, Emmett R. Smith; Instructors, Boys' Classes, Thomas P. Burns, James F. Crotty, Daniel M. Daley, James A. Dunbar, Charles O. Halloran, Joseph A. Mahoney, William V. McKenney, John J. Murray, James M. Nelligan, Albert L. Shaughnessy, James P. Sullivan, Charles P. York; Shop Foremen, James A. Linney, Stewart J. Shaw; Instructors, Joseph H. Gildea, Vincent L. Greene, James L. O'Brien, Vincent J. Readdy John P. Shea; Assistants, Beatrice C. Blanchard, Anne M. Coveney, Helena M. Demp-

sey, Mary A. Fletcher, Elizabeth C. Flynn, Margaret G. Fox, Clara H. Franke, Elsie R. Gilbert, Alice J. Healy, Elizabeth A. Keenan, Mary Kelly, Louise C. Keyes, Mary E. MacSwiney, Alice D. Murley, Julia R. O'Brien, Austina B. Raymond, Anna M. Sheehan, Teresa A. Tehan; Vocational Assistant, Margaret L. Sheridan; Shop Instructors, Patrick J. Fox, Rudolph Marginot, Francis R. Sheehan, Trade Assistants, Louise M. Hall, Alice McCarthy, Grace G. O'Brien, Winifred T. Ormond, Annie L. Robertson . . 52

DAY SCHOOL FOR IMMIGRANTS.

Appointed: *To serve during the pleasure of the School Committee.*— Assistant in Charge, Caroline A. Shay . . . 1

Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Mary H. Stroup 1

— 2

DISCIPLINARY DAY SCHOOL.

Appointed: *To serve during the pleasure of the School Committee.*— Assistants, Elizabeth A. Donahue, M. Gertrude Godvin 2

Appointed: *To serve for the term ending August 31, 1923.*— Assistant, Caroline Pendleton 1

— 3

PART III.

REAPPOINTMENTS OF TEACHERS OF PHYSICAL TRAINING AND MILITARY DRILL.

PHYSICAL TRAINING.

Now serving on tenure		2
Appointed: *To serve for the term ending August 31, 1923.*—Supervisor in charge of Playgrounds, Julia A. Murphy		1

MILITARY DRILL.

Now serving on tenure		1
Appointed: *To serve for the term ending August 31, 1923.*—Instructors, Joseph McK. Driscoll, James J. Kelley, George S. Penney, Charles A. Ranlett		4
		5

PHYSICAL TRAINING INSTRUCTORS IN NORMAL, LATIN AND DAY HIGH SCHOOLS.

Now serving on tenure.		
Normal School	1	
Girls' Latin School	1	
Brighton High School	1	
Charlestown High School	1	
Dorchester High School	1	
East Boston High School	1	
Girls' High School	2	
High School of Practical Arts	1	
Roxbury High School	2	
South Boston High School	1	
West Roxbury High School	2	
	—	14
Appointed: *To serve during the pleasure of the School Committee.*— Dorchester High School, Assistant Instructor in Physical Training, Josephine U. Heffernan	1	
Hyde Park High School, Instructor in Physical Training, Agnes S. Thompson	1	
Appointed: *To serve for the term ending August 31, 1923.*— Girls' Latin School, Assistant Instructor in Physical Training, Eleanor H. Quinlan	1	
Dorchester High School, Assistant Instructor in Physical Training, Miriam R. Driscoll	1	

East Boston High School, Assistant Instructor in Physical Training, Clare Eastman	1	
Girls' High School, Assistant Instructors in Physical Training, Genevieve A. Burns, Alice M. Gorman	2	
Roxbury High School, Assistant Instructor in Physical Training, Rosamond W. Estabrook	1	
South Boston High School, Assistant Instructor in Physical Training, Angela C. McManus	1	
	—	9

Respectfully yours,

JEREMIAH E. BURKE,
Superintendent of Public Schools.

(600-6-10-22)

SCHOOL DOCUMENT NO. 4—1922

BOSTON PUBLIC SCHOOLS

CANDIDATES ELIGIBLE FOR APPOINTMENT AS TEACHERS

JULY, 1922

BOSTON
PRINTING DEPARTMENT
1922

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Boston Public Schools,
Office of Board of Superintendents,
Mason Street, July 31, 1922.

This document comprises the seventeenth list of candidates eligible for appointment to permanent positions in the public day schools of Boston, revised and completed to date. It contains the names of all candidates included in the list issued in July, 1921, who have not yet been appointed to permanent positions in the service and whose certificates are still valid, with the exception of those who have asked that their names be omitted from this list. It also contains the names of persons who have successfully passed examinations held since that date, including Boston Normal School graduates of June, 1922.

Graduates of the Boston Normal School prior to June, 1922, whose names are entered in this list have been regraded by the Board of Superintendents in accordance with the rules of the School Committee (section 83, paragraph 2), and their present ratings supersede those given in the 1921 list.

CLASS-ROOM INSPECTION OF CANDIDATES FOR CERTIFICATES OF QUALIFICATION.

All candidates certificated for permanent day school service have been visited in the class room by a member of the Board of Superintendents, with the exception of those whose original examination included a demonstration lesson. The results of the class-room demonstrations are given weight in determining the credit to be allowed for "Experience in Teaching."

SCHOOL NURSES.

This document also contains the names of candidates for appointment as school nurses in the public schools. The regulations of the School Committee with respect to

the appointment, reappointment, assignment, transfer, removal, tenure of office, and marriage of teachers apply in general to nurses, and their certificates cease to be valid in accordance with the regulations governing the expiration and revocation of teachers' certificates of qualification.

PREPARATION OF ELIGIBLE LISTS.

Eligible lists of candidates with their respective ratings are annually prepared by the Board of Superintendents in the month of June, which lists include the names of graduates of the Boston Normal School arranged in the order of their respective qualifications.

Appointments of teachers and members of the supervising staff are made from the eligible lists in effect at the time of appointment; provided, that the names of candidates successfully passing prescribed examinations shall, from time to time as examinations occur, be added to said lists on the dates upon which the results of such examinations and the ratings of the candidates shall be reported by the Board of Superintendents to the Board.

ELIGIBLE LISTS MAILED CANDIDATES.

A copy of the eligible lists, as soon as printed, is mailed to persons whose names appear thereon.

APPOINTMENTS FROM THE ELIGIBLE LISTS.

Except as hereinafter provided, no person may be appointed to a permanent position as a member of the supervising staff or as a teacher, whose name does not head the proper eligible list and who is willing to accept such appointment; provided, that if in the opinion of the Superintendent there is good reason why such person should not be appointed, he shall so certify to the Board, whereupon the same procedure shall be followed with respect to the second person on the list; but the person appointed shall be one of the first three on said list willing to accept appointment.

APPOINTMENTS NOT GOVERNED BY ELIGIBLE LISTS.

Appointments as principal or teachers in the Normal School, as director, associate director, first assistant director or assistant director of a special subject or department (with certain exceptions), as supervisor or assistant supervisor of a special subject or department, as medical inspector of special classes, as supervising nurse, as supervisor in charge of playgrounds, as temporary teacher, as substitute, as special assistant, as teacher in the evening schools, are not governed by the eligible lists.

AGE LIMITATION.

No person may be appointed to the permanent day school service, except to the Normal School and to certain supervisory positions as specified in the regulations of the Board, to take effect later than the thirtieth day of June following the fortieth birthday of such person. This limitation, however, does not affect the promotion of a permanent teacher or member of the supervising staff to any position in the public schools.

REMOVALS AND RESTORATIONS OF NAMES FROM AND TO ELIGIBLE LISTS.

The names of persons holding certificates which include certificates of a lower grade may, upon request, be included in the eligible list of such lower grade or grades according to the rating of such holders of certificates in their respective examinations, but they shall not be entitled to a higher rating on such lower list or lists by reason of their holding higher grade certificates.

The names of persons appointed to permanent positions in the day school service are removed from the eligible lists.

A person whose name appears upon the eligible lists may, upon request, have the same removed therefrom at any time, and may, upon written application, have it restored to the next eligible lists in June of any year during the life of the certificate, with the same rating

as before; or, if a graduate of the Boston Normal School, with such re-rating as the Board of Superintendents may determine; provided, that such restoration shall not operate to extend the original period for which the certificate is valid.

The names of persons appointed as substitutes, temporary teachers, special assistants, or as teachers in the evening schools, or in playgrounds, or as temporary nurses, are not removed from their respective eligible lists because of such appointment.

The name of any person who has refused three offers of permanent appointment shall be dropped from the eligible list for the current school year. The name of any person appearing upon any eligible list who has failed of appointment on three separate occasions when another person on the same list has been selected and appointed, shall be dropped therefrom and shall not be restored thereto except by another examination.

CHANGE IN RATING.

Persons whose names appear on any eligible list and who desire to have their ratings changed, may have this done by passing another examination.

NORMAL SCHOOL GRADUATES MAY OBTAIN RATINGS UPON OTHER LISTS.

Boston Normal School graduates may obtain positions on the regular Elementary, Class B list by passing the prescribed examination. In that event they will be rated on the "Examined List" according to the results of such examination, and their names will be removed from the lists of holders of Normal School certificates.

DATES OF CERTIFICATE EXAMINATIONS.

The Board of Superintendents annually conducts examinations of candidates for appointment as members of the supervising staff and as teachers in the public schools.

Examinations for day school certificates are held annually, at the Boston Normal School, Huntington avenue and Longwood avenue, and beginning in December, 1922, will be held during the week of the Boston Christmas vacation.

The next examinations for day school certificates will be held during the week of the Christmas vacation, beginning Tuesday, December 26, 1922.

For schedule of dates for the several certificates, application should be made to the Office of the Secretary of the School Committee, Mason street, Boston.

The 1922 examinations for evening schools will be held on Friday, September 15, at the Boston Normal School, Huntington avenue and Longwood avenue.

CITIZENSHIP REQUIREMENTS.

The Board of Superintendents shall not admit to certificate examinations persons who are not citizens of the United States, unless they shall have filed their declaration of intention to become citizens.

RE–EXAMINATION FOR CERTIFICATES.

A person taking more than one examination of the same class is rated on the eligible list of that class solely upon the results of the latest examination; provided, that holders of the certificates of qualification IV. High School, XXV. Junior Assistant, or XXXIII. Intermediate, may, by re-examination, obtain a rating in more than one group under said certificates; and provided, further, that if a person holding a valid certificate of qualification shall be re-examined for a certificate of the same grade and shall obtain a rating lower than that held at the time of such re-examination, he may, in the discretion of the Board of Superintendents, retain his original rating, with date of expiration of certificate unchanged.

Detailed information with regard to examinations may be obtained in advance by application to the Secretary of the School Committee.

EXPIRATION AND REVOCATION OF CERTIFICATES.

Certificates issued on examination after June 1, 1906, cease to be valid on the thirtieth day of June of the sixth year following the date of issue; provided, that no certificate shall remain valid after the thirtieth day of June next following the fortieth birthday of the holder thereof, except as hereinafter specified. This limitation as to age does not affect the validity of certificates which do not render the holders eligible for appointment to permanent positions in the day school service, nor certificates qualifying for appointment to certain supervisory positions as specified in the regulations of the Board; nor does it affect the validity of certificates held by teachers and members of the supervising staff who are employed in the permanent day school service.

Certificates issued on examination prior to June 1, 1906, ceased to be valid on the thirtieth day of June of the second year following the date of issue, except as hereinafter provided.

* Certificates issued to graduates of the Boston Normal School prior to June 1, 1906, ceased to be valid June 30, 1912, except as hereinafter specified.

* Certificates issued to graduates of the Boston Normal School after June 1, 1906, cease to be valid on the thirtieth day of June of the sixth year following the date of issue, except as hereinafter provided.

Certificates issued on examination prior to June 1, 1906, and valid on that date by reason of renewal or of service in the Boston public schools, ceased to be valid June 30, 1908, except that regular high school certificates held by teachers serving during the year ending June 30, 1906, in permanent positions in the day elementary schools of Boston, ceased to be valid June 30, 1912, except as hereinafter provided.

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* By action of the School Committee on April 22, 1912, the validity of Normal School certificates, issued in June, 1906, and prior to that date, was extended to June 30, 1913, with the distinct understanding that under no circumstances shall the validity of other certificates as now determined by the rules be extended.

The validity of certificates issued prior to June 1, 1906, which include positions in day schools of a different class, but which also include the position in which the holder thereof is employed, expired with respect to such day schools of a different class on June 30, 1912; nor does the validity of any certificate issued after June 1, 1906, extend beyond the thirtieth day of June of the sixth year following the date of issue by reason of the service of the holder thereof in schools of a different class than that in which the holder is employed.

The validity of certificates of qualification covering service in the day elementary schools held by teachers regularly employed in the Continuation School on September 1, 1920, whose return to the elementary schools is permissive under the regulations of the Board, shall be valid until the thirtieth day of June of the sixth year thereafter; and in the case of teachers appointed to the Continuation School subsequent to September 1, 1920, until the thirtieth day of June of the sixth year following such appointment.

All certificates under which appointments are made to permanent positions in the day school service, and certificates of a higher grade, but including the position in which the holder thereof is employed, remain valid with respect to the class of schools in which the holder thereof is employed during the term of such service.

All certificates, except those under which appointments are made to permanent positions in the day school service, cease to be valid when the names of the holders are permanently removed from the eligible lists.

Any certificate may be revoked by the Board of Superintendents, if, in its opinion, the good of the service so demands.

TEMPORARY CERTIFICATES AND LICENSES.

All certificates are non-renewable, but the Board of Superintendents may issue instead thereof temporary

certificates or licenses under such conditions as that Board may determine, which entitle the holders to serve in temporary positions of such rank and in such schools as may be specified.

Temporary certificates are valid for such length of time as the Board of Superintendents may determine, but not beyond the thirtieth day of June of the sixth year following the date of issue. Licenses may not extend beyond the thirty-first day of August of the second year following the date of issue.

THORNTON D. APOLLONIO,
Secretary.

HIGH SCHOOL CERTIFICATE.

Ancient Languages.

Rating.	Name.	Certificate Expires
902	Charles Jones	June 30, 1923

Botany–Zoology.

864	Esther M. Patch	June 30, 1928
776	Julia A. Holteen	" 30, 1928

Commercial Branches.

BOOKKEEPING AND COMMERCIAL ARITHMETIC.

869	Walter E. Leidner	June 30, 1928

PHONOGRAPHY AND TYPEWRITING.

Men.

809	Frederick L. Carney	June 30, 1928
700	James M. Nelligan	" 30, 1928

Women.

859	Marion Renfrew	June 30, 1926
820	Winifred H. Rogers	" 30, 1928
744	Catherine E. Creedan	" 30, 1928

Dressmaking.

809	Alice E. Babson	June 30, 1928
785	Margaret Alexander	" 30, 1928

Economics.

773	Stephen V. White	June 30, 1925
734	Thomas P. Burns	" 30, 1928

English.

Men.

863	Winslow H. Loveland	June 30, 1928
791	William J. Gross	" 30, 1928
766	Wilfred N. Hinckley, Jr.	30, 1928
756	Thomas A. Donnelly	" 30, 1928
736	John F. Sheehan	" 30, 1928
702	Thomas F. Galvin	" 30, 1928

Women.

905	Constance Billings	June 30, 1928
866	Helen Beveridge	" 30, 1928
819	Frances R. Campion	" 30, 1928
818	Mary F. Toland	" 30, 1928
817	Charlotte W. Onthank	" 30, 1926
797	Ellen L. Duffey	" 30, 1927
791	Eleanor K. O'Connell	" 30, 1928
788	Gertrude D. Halbritter	" 30, 1928

High School Certificate — Continued.

Rating.	Name.	Certificate Expires
779	Lilian Holmes	June 30, 1928
757	Eleanor Berg	" 30, 1928
750	Mary A. McMahon	" 30, 1928
739	Evelyn G. McNamara	" 30, 1927
737	Adelia MacMillan	" 0, 1928
713	Mary A. Davis	" 30, 1924
	FRENCH.	
	Men.	
767	Aldege J. Dubois	June 30, 1928
	Women.	
844	Anastasia B. Connor	June 30, 1927
808	Ellen C. Hoy	" 30, 1928
778	Dorothy Stanwood	" 30, 1928
771	Edith H. Bradford	" 30, 1923
748	Marion E. Fitzgerald	" 30, 1927
723	Marguerite McKelligett	" 30, 1926
706	Marguerite L. Murphy	" 30, 1928
	GENERAL SCIENCE.	
	Men.	
865	John V. Jewett	June 30, 1926
856	John A. Dunn	" 30, 1928
	Women.	
793	Maude Welch Barlow	June 30, 1926
	GERMAN.	
859	Helen M. Fitzgerald	June 30, 1923
	HISTORY.	
	Men.	
888	Earl S. Lewis	June 30, 1923
865	Lester H. Cushing	" 30, 1923
766	Frank L. Mansur	" 30, 1926
749	Maurice G. Murphy	" 30, 1928
735	John J. Murray	" 30, 1928
728	John J. Brennan	" 30, 1928
728	William J. Murphy	" 30, 1928
727	Bernard F. Donovan	" 30, 1928
717	William V. McKenney	" 30, 1928
715	Vincent L. Greene	" 30, 1928
711	Frederick J. Murray	" 30, 1928
707	Charles P. York	" 30, 1928
	Women.	
869	Marion Chesley	June 30, 1928
849	Marie R. Madden	" 30, 1923
799	Frances W. Given	" 30, 1923
775	E. Beatrice Mahaney	" 30, 1928
759	Elsie E. Whitney	" 30, 1928

High School Certificate — Continued.

HOUSEHOLD SCIENCE.

Rating.	Name.	Certificate Expires
878	Helen L. P. Pollycutt	June 30, 1928
832	Lucy H. Nash	" 30, 1928
794	Dorothy A. Chapin	" 30, 1928
778	Mary M. Giblin	" 30, 1927
718	Dorothea N. Rice	" 30, 1928

MANUAL ARTS.

DRAWING.

805	May J. Duff	June 30, 1928

MATHEMATICS.

Men.

956	Albert J. Dow	June 30, 1927
900	Ray D. Farnsworth	" 30, 1928
869	Paul A. Saunders	" 30, 1928
850	Thomas J. Hoey	" 30, 1928
840	Enor E. Lundin	" 30, 1928
785	Charles H. Mergendahl	" 30, 1924
782	Matthew F. Mealy	" 30, 1928
775	Walter V. O'Brien	" 30, 1928
769	John C. Page	" 30, 1926

Women.

733	Christina S. Little	June 30, 1928

PHYSICS–CHEMISTRY.

Men.

899	Elliott P. Frazier	June 30, 1928
890	Kurt G. Busiek	" 30, 1928
881	Martin G. Sanborn	" 30, 1928
879	Walter F. Burt	" 30, 1927
871	Hollis D. Hatch	" 30, 1927
851	Fred Holmes	" 30, 1928
842	John H. Card	" 30, 1928
825	Daniel J. Shea	" 30, 1928
810	Arthur B. Stanley	" 30, 1923
796	John W. McCormack	" 30, 1923
788	Ralph H. Bragdon	" 30 1923
786	Lawrence A. Howard	" 30, 1928
786	James P. Shattuck	" 30, 1928
752	Clarence W. Lombard	" 30, 1928
732	Francis O'Meara	" 30, 1928

Women.

836	Josephine M. Minihan	June 30, 1928
823	Mary G. L. Pickett	" 30, 1923

SALESMANSHIP.

757	Persis M. Pottinger	June 30, 1928

High School Certificate — Concluded.

SPANISH.

Men.

Rating.	Name.	Certificate Expires
825	Cecil T. Derry	June 30, 1923
805	Cipriano Montoliu	" 30, 1924

Women.

810	Grace H. Kennedy	June 30, 1923
796	Marie Scollard	" 30, 1926
749	Clarette L. Rogers	" 30, 1927
729	Hester C. Sharkey	" 30, 1928
727	Evelyn M. Brawley	" 30, 1928
707	Sara B. Dreney	" 30, 1928
700	Regina D. Madden	" 30, 1928
700	Leonora C. Murray	" 30, 1923

SPECIAL CERTIFICATES VALID IN DAY HIGH SCHOOLS.

COMMERCIAL BRANCHES.

BOOKKEEPING AND COMMERCIAL ARITHMETIC.

Men.

Rating.	Name.	Certificate Expires
869	Charles A. Cederberg	June 30, 1927
710	Francis J. Lally	" 30, 1927

Women.

837	Teresa A. Regan	June 30, 1928
741	Jeannie F. Shean	" 30, 1924
717	Mary Stuart	" 30, 1928

PHONOGRAPHY AND TYPEWRITING.

Men.

874	Harold B. Foye	June 30, 1926
824	George F. McCarthy	" 30, 1928
751	Basil N. Perkins	" 30, 1928

Women.

784	Alice G. Carr	June 30, 1925
768	Catherine E. Creedan	" 30, 1927
757	Mary E. Doherty	" 30, 1925
757	Mary B. Killion	" 30, 1928
752	Jessica J. Trommer	" 30, 1928
750	Annie C. Johnson	" 30, 1926
727	Agnes V. Scannell	" 30, 1923
717	Lillian H. Austin	" 30, 1928
704	Mary H. Plimpton	" 30, 1926
702	May M. Austin	" 30, 1924

Special Certificates Valid in Day High Schools — Concluded.

MANUAL ARTS.

DRAWING.

Men.

Rating.	Name.	Certificate Expires
753	Alfred F. Burke	June 30, 1926
752	Casimir F. Shea	" 30, 1928
719	Carl H. Adams	" 30, 1926
712	Roland S. Stebbins	" 30, 1923

Women.

814	Grace N. Aznive	June 30, 1928
797	Clara E. Glover	" 30, 1925
774	Florence F. Cooper	" 30, 1926
771	Evelyn Silvester	" 30, 1924
724	Marion McIntyre Ford	" 30, 1927

MANUAL TRAINING.

740	Kenrick M. Baker	June 30, 1924
706	William A. Courchene	" 30, 1924

PHYSICAL TRAINING.

846	Theresa B. Maley	June 30, 1924
839	Marjorie Woodhead	" 30, 1927
838	Helena M. Kees	" 30, 1927
826	Gertrude M. Fossett	" 30, 1924
826	Katherine E. McCarty	" 30, 1927
818	Dorothy Sayer	" 30, 1928
816	Florence C. McGann	" 30, 1926
812	Mary T. McDermott	" 30, 1924
807	Virginia E. Pierce	" 30, 1924
793	Elisabeth M. Hampe	" 30, 1924
781	Joanne F. Tobin	" 30, 1928
776	Rae F. Hoffman	" 30, 1928
772	Anna L. Cahill	" 30, 1928
770	Matilda F. Ractliffe	" 30, 1924
768	Matilda E. Cogan	" 30, 1924
755	Margaret A. Naughton	" 30, 1928
745	Mildred A. McCarthy	" 30, 1927
742	Dorothy E. Bresnahan	" 30, 1927
740	Mary J. Sharkey	" 30, 1927
733	Marie A. Reardon	" 30, 1928
713	Anna A. Norton	" 30, 1928
703	Agnes C. McKenna	" 30, 1928

SALESMANSHIP.

839	Gladys C. Gilmore	June 30, 1924
827	Helen J. Kiggen	" 30, 1924
790	Margaret A. Cronin	" 30, 1928

VOCATIONAL INSTRUCTOR AND VOCATIONAL ASSISTANT CERTIFICATE.

Assistants.

Rating.	Name.	Certificate Expires
804	Elna C. Anderson	June 30, 1927
790	Abigail D. Steere	" 30, 1928

INDUSTRIAL INSTRUCTOR, DAY HIGH SCHOOLS CERTIFICATES.

DRESSMAKING.

Rating.	Name.	Certificate Expires
718	Mildred H. Tagen	June 30, 1927

MILLINERY.

806	Ruth H. Simms	June 30, 1927
772	Mary A. Hourihan	" 30, 1924
720	Dorothy M. Gorman	" 30, 1928

JUNIOR ASSISTANT CERTIFICATE.

ECONOMICS.

Rating.	Name.	Certificate Expires
792	Frank D. Shea	June 30, 1928

ENGLISH.

Men.

856	Gordon F. Irons	June 30, 1928
838	Edward J. Gill	" 30, 1928
755	Maurice F. Murphy	" 30, 1928
733	Mark F. Russo	" 30, 1928

Women.

841	Madeline M. Ellis	June 30, 1923
817	Agnes G. Doggett	" 30, 1928
810	Agnes E. Kelley	" 30, 1924
778	Katherine Moran	" 30, 1923
775	Elinor J. Fowles	" 30, 1928
732	Mary A. Winn	" 30 1923

FRENCH

849	Agnes M. Carven	June 30, 1928
831	Sophia B. Cohen	" 30, 1928
824	Winifred A. Dowd	" 30, 1928
718	Mildred A. Dacey	" 30, 1923

Junior Assistant Certificate — Concluded.

HISTORY.

Men.

Rating.	Name.	Certificate Expires
866	Francis J. Roland	June 30, 1928
768	Bernard H. McGrath	" 30, 1928
735	Saul L. Seiniger	" 30, 1924
722	William J. Murphy	" 30, 1923
715	Joseph A. Donahoe	" 30, 1927

Women.

869	Alice Sullivan	June 30, 1928
834	Virginia E. Turnbull	" 30, 1928
791	Marion C. Gilman	" 30, 1928
774	Gertrude E. Rockwood	" 30, 1928
732	Mary C. Brogan	" 30, 1923

LATIN.

822	Thomas A. O'Donnell	June 30, 1928
807	Joseph F. X. Healy	" 30, 1928
779	Richard G. Donahue	" 30, 1923

MATHEMATICS.

Men.

790	Henry M. J. Halligan	June 30, 1923
767	Frank A. Gilbert	" 30, 1928
712	Christopher A. Connor	" 30, 1923

Women.

821	Theresa V. Coleman	June 30, 1928
765	Helen E. Murphy	" 30, 1928

PHONOGRAPHY AND TYPEWRITING.

767	Agnes T. Conroy	June 30, 1924

PHYSICS—CHEMISTRY.

Men.

780	Edwin C. Kennedy	June 30, 1928
735	Angus J. Chisholm	" 30, 1928
719	William J. Dee, Jr.	" 30, 1928

Women.

856	Mary E. Neal	June 30, 1928

SPANISH.

Men.

731	James E. Fihelly	June 30, 1923

Women.

783	Ruth E. McHale	June 30, 1928
761	Dorothy M. Ellis	" 30, 1928

NORMAL SCHOOL ELEMENTARY CERTIFICATES, CLASS OF 1922, AND OTHERS AS INDICATED.

(*Certificate covers Grades I. to VI., inclusive, except as indicated.*)

Rating.	Name.	Certificate Expires
844	Ethel J. Birrell (Class of 1921)	June 30, 1927
841	Edith E. Anderson	" 30, 1928
840	Mary M. Mallard (Class of 1920)	" 30, 1926
835	Florence M. Fischer	" 30, 1928
824	Marion L. Carnegie	" 30, 1928
819	Bertha L. Fleming	" 30, 1928
817	Elizabeth S. Devlin	" 30, 1928
817	Millicent S. Stroup	" 30, 1928
816	Charlotte L. Adams	" 30, 1928
814	Rose Michaelson	" 30, 1928
813	Helen I. Shaw	" 30, 1928
812	Mary E. Walsh	" 30, 1928
811	Blanche Smith	" 30, 1928
806	Dorothea C. Ruth	" 30, 1928
806	Mary D. FitzGerald*	" 30, 1928
806	Marion L. Sharp	" 30, 1928
805	Helen R. Dempsey*	" 30, 1928
805	Mary G. Maloney	" 30, 1928
804	Frances I. Barr	" 30, 1928
803	June M. Raymond	" 30, 1928
803	Gertrude E. Rockwood† (Class of 1919)	" 30, 1925
802	Rose M. Sullivan	" 30, 1928
802	Helen F. Kirby	" 30, 1928
801	Grace K. Maloney	" 30, 1928
799	Constance M. Sheridan	" 30, 1928
799	Viola M. Griffin	" 30, 1928
798	Eleanor R. Kiernan*	" 30, 1928
794	Marie J. Kupelian	" 30, 1928
792	Sylvia M. Murray	" 30, 1928
791	Julia J. McCarthy	" 30, 1928
790	Catherine M. Herbert*	" 30, 1928
789	Margaret R. McLaughlin*	" 30, 1928
788	Marian MacKay (Class of 1921)	" 30, 1927
788	Mary E. Rockwood	" 30, 1928
787	Mary A. Barrett	" 30, 1928
786	Anna E. Scott (Class of 1920)	" 30, 1926
786	Anna H. Donnelly	" 30, 1928
786	Idabelle L. Morrissey	" 30, 1928
786	Mary E. Keep	" 30, 1928
785	Eva Chofnas	" 30, 1928
781	Alice F. Wood	" 30, 1928
780	Mary E. Morgan	" 30, 1928
779	Agnes M. Lynch	" 30, 1928
779	Isabelle M. Harvey	" 30, 1928
779	Margaret A. Lynch (Class of 1920)	" 30, 1926

* Holds Normal, Kindergarten-Primary Certificate.

† Certificate covers all elementary grades.

Normal Elementary, Class of 1922 — Concluded.

Rating.	Name.	Certificate Expires
778	Marie O. Day	June 30, 1928
778	Barbara T. Raithel	" 30, 1928
778	Margaret E. Devine*	" 30, 1928
778	Virginia E. Turnbull† (Class of 1919)	" 30, 1925
778	Edna M. J. Snow	" 30, 1928
776	Margaret M. Moriarty	" 30, 1928
773	Francette E. Madigan	" 30, 1928
773	Ellen E. Bryan	" 30, 1928
772	Alice M. McLaughlin	" 30, 1928
772	Lillian M. McCormick	" 30, 1928
771	Mary V. O'Keeffe	" 30, 1928
768	Mary C. Matthes	" 30, 1928
768	Virginia K. deHaro	" 30, 1928
767	Marie J. Manning	" 30, 1928
767	Loraine L. Wright*	" 30, 1928
764	Elizabeth D. Carroll	" 30, 1928
762	Mary E. Osborne	" 30, 1928
762	M. Victorine Monast	" 30, 1928
761	Marion F. O'Brien	" 30, 1928
755	Eva Shulman	" 30, 1928
753	Felicia A. Koziewicz	" 30, 1928
752	Doris S. Kennedy	" 30, 1928
752	Rose A. O'Connell	" 30, 1928
750	Caroline A. Gould	" 30, 1928
748	Julia V. Dee*	" 30, 1928
743	M. Elizabeth Fleming	" 30, 1928
738	Margaret V. Conway† (Class of 1918)	" 30, 1924
738	Henrietta W. Sheinker*	" 30, 1928
737	Gertrude V. Kenney	" 30, 1928
737	Helen R. Sullivan† (Class of 1918)	" 30, 1924
733	Eleanor M. Raferty	" 30, 1928
732	Mary E. Quirke	" 30, 1928
729	Mary L. Thurston	" 30, 1928
724	Nella Bacciola	" 30, 1928
724	Paraskeve Sarhani	" 30, 1928
720	Eleanor M. M. Santosuosso	" 30, 1928
712	Marie L. Pennucci	" 30, 1928
707	Mary A. Moore	" 30, 1928

NORMAL SCHOOL ELEMENTARY CERTIFICATES, PRIOR TO 1922.

(Certificate covers all elementary grades except as indicated.)

Rating.	Name.	Certificate Expires
901	Dorothy M. Lyons	June 30, 1924
883	Marie Scollard‡	" 30, 1924

* Holds Normal, Kindergarten-Primary Certificate.
† Certificate covers all elementary grades.
‡ Holds Elementary School Special Certificate.

Normal Elementary, Prior to 1922 — Concluded.

Rating.	Name.	Certificate Expires
865	George S. McCabe*	June 30, 1923
864	Christopher A. Connor*	" 30, 1923
862	Everett C. Yates*	" 30, 1923
860	Abigail F. Burke	" 30, 1923
856	Albert F. Smith*	" 30, 1923
816	Elinor J. Fowles	" 30, 1924
812	Mary A. Winn*	" 30, 1923
806	Agnes L. McQueeney	" 30, 1924
797	Evelyn D. Costello‡	" 30, 1927
780	Helen Carey	" 30, 1923
780	Saul L. Seiniger*	" 30, 1924
779	Francis R. McManus*	" 30, 1923

INTERMEDIATE AND ELEMENTARY SCHOOL CERTIFICATES, EXAMINED CANDIDATES.

Intermediate Certificates.

DRAWING.

Rating.	Name.	Certificate Expires
827	Bessie E. Kennedy (1)	June 30, 1924
810	Edith M. Snow (2)	" 30, 1924
742	Paulina V. Burns (1)	" 30, 1928

ENGLISH.

876	Alice M. Roche† (3)	June 30, 1928
861	Katherine M. Beebe (4)	" 30, 1928
854	Mary I. Dwyer (3)	" 30, 1928
819	Mary F. McAuliffe† (4)	" 30, 1928
793	Olive E. Whittier (5)	" 30, 1928
773	Sarah H. Christie (5)	" 30, 1925
761	Lucie M. Grenier (3)	" 30, 1928
759	Helen M. Corrigan (6)	" 30, 1928
701	Frances M. Spooner† (3)	" 30, 1927

FRENCH.

755	Eleanor H. Matson (5)	June 30, 1927
708	Mary Sullivan Garrity (1)	" 30, 1928

HISTORY–GEOGRAPHY.

Men.

880	John J. Boyan† (7)	June 30, 1928
865	Harold L. Kendall† (8)	" 30, 1927
786	William F. Mahoney† (7)	" 30, 1928
704	Francis O. Wood (7)	" 30, 1928

* Holds Elementary School Special Certificate.
† Holds Elementary School, Class A Certificate.
‡ Certificate covers Grades I. to VI., inclusive.

Intermediate and Elementary Certificates, Examined Candidates — Continued.

Women.

Rating.	Name.	Certificate Expires
915	Mary C. Haggerty (7)	June 30, 1928
878	Mary S. Ireland (7)	" 30, 1927
867	Anna M. Killion (7)	" 30, 1926
795	Gertrude M. Burke (9)	" 30, 1928
793	Mary H. Healey* (10)	" 30, 1928
775	Catharine L. Heagney (7)	" 30, 1928
773	Ida E. Penell* (7)	" 30, 1927
750	Helen E. Sullivan* (7)	" 30, 1928
746	May B. Thompson* (7)	" 30, 1926
733	Mary F. Roome (11)	" 30, 1926

LATIN.

724	Ellen G. White (12)	June 30, 1928

MATHEMATICS.

Men.

873	William F. Mack* (13)	June 30, 1927
780	George F. Barry (14)	" 30, 1928
775	James A. Donovan (15)	" 30, 1928

Women.

780	Helen G. McKenna* (16)	June 30, 1924
775	Bertha L. Palmer (17)	" 30, 1926

MUSIC.

839	Mary L. McNamara (11)	June 30, 1927

SCIENCE.

773	Frederick L. Mahoney (3)	June 30, 1928

ELEMENTARY SCHOOL, CLASS A CERTIFICATE.

873	William F. Mack	June 30, 1927
872	Harold L. Kendall	" 30, 1927
792	William F. Mahoney	" 30, 1928
790	George L. McKinnon	" 30, 1923

* Holds Elementary School, Class A Certificate.

MINOR SUBJECTS:

(1) English, Music.
(2) History-Geography, Music.
(3) Mathematics, History-Geography.
(4) Mathematics, Drawing.
(5) Mathematics, Spanish.
(6) History-Geography, French.
(7) English, Mathematics.
(8) Mathematics, Science.
(9) Mathematics, Music.
(10) English, French.
(11) English, Drawing.
(12) Mathematics, French.
(13) History-Geography, Latin.
(14) History-Geography, Science.
(15) English, Latin.
(16) Drawing, Music.
(17) English, History-Geography.

Intermediate and Elementary Certificates, Examined Candidates — Continued.

ELEMENTARY SCHOOL, CLASS B CERTIFICATE.

(Certificate covers Grades I. to VI., inclusive.)

Rating.	Name.	Certificate Expires
919	Katherine M. Coughlan	June 30, 1928
919	S. Margaret Knowlton	" 30, 1928
903	Pauline Rafter Powers	" 30, 1928
888	Nina B. Hartford	" 30, 1923
880	Kathryn I. Supple	" 30, 1928
878	Katherine H. Lyman	" 30, 1928
857	Bertha R. Doyle	" 30, 1928
850	Jennie Bresth	" 30, 1928
842	Edna D. Taylor	" 30, 1925
839	Agnes Shannon	" 30, 1928
831	Elizabeth A. Clark	" 30, 1924
825	Gertrude M. Sullivan	" 30, 1928
824	Agnes C. King	" 30, 1928
819	Madaline Small	" 30, 1928
818	Helen E. Burns	" 30, 1928
818	May A. Donovan	" 30, 1928
815	Helen Judge Gregory	" 30, 1927
812	Mary A. Salmon	" 30, 1928
802	Mary A Bassett	" 30, 1928
800	Elsie F. Eagan	" 30, 1928
798	Mary T. G. Ward	" 30, 1928
795	Natalie Taylor Callanan	" 30, 1928
795	Sadie A. Murphy	" 30, 1924
795	Ruth D. Waldron	" 30, 1928
790	Katharine E. Cagney	" 30, 1928
789	Eva O. Diack	" 30, 1927
786	Catherine G. O'Hara	" 30, 1928
781	Margaret V. Lamb	" 30, 1928
781	Mary C. McQuaid	" 30, 1928
776	Mary J. Moriarty	" 30, 1928
774	Catharine A. McGinty	" 30, 1925
773	Anna L. Cremins	" 30, 1928
771	Margarita E. Burns	" 30, 1923
768	Alice L. Devery	" 30, 1927
766	Harriet A. Haggerty	" 30, 1928
763	Margaret F. Hamilton	" 30, 1928
763	Estelle M. Sexton	" 30, 1928
761	Annie C. Johnson	" 30, 1926
760	Alice C. Gilligan	" 30, 1925
757	Ellen L. Harris	" 30, 1928
754	Catherine M. Hanley	" 30, 1927
750	Marion J. Finnin	" 30, 1928
749	Mary Moran Russell	" 30, 1924
748	Beatrice E. Drake	" 30, 1928
742	Gladyce L. Howland	" 30, 1928

Intermediate and Elementary Certificates, Examined Candidates — Concluded.

Rating.	Name.	Certificate Expires
741	Margaret M. Loschi	June 30, 1928
737	Grace E. Murphy	" 30, 1928
735	Marion W. Sheldon	" 30, 1928
732	Margaret M. Smith	" 30, 1928
726	Margaret H. Hinkley	" 30, 1928
724	Wilhelmina M. Crosson	" 30, 1928
719	Bernecia E. Avery	" 30, 1928
718	Frances M. Hendrick	" 30, 1928
717	Alice L. Galvin	" 30, 1928
713	Dorothy G. Cudmore	" 30, 1928
713	Gertrude P. Cutler	" 30, 1928
713	Grace E. Taylor	" 30, 1928
712	Abbie M. Duane	" 30, 1928
711	Mildred K. Herlihy	" 30, 1928
711	Mary J. Murphy	" 30, 1928
710	Marie G. Hassett	" 30, 1928
710	Mary E. Kelleher	" 30, 1928
710	Lillian A. Penell	" 30, 1924
708	Mary M. O'Gara	" 30, 1927
703	Agnes G. Hurley	" 30, 1928
701	E. Gertrude O'Reilly	" 30, 1928
700	Pearl B. Hanson	" 30, 1927
700	Ethel E. Trefry	" 30, 1927

KINDERGARTEN CERTIFICATES.

Normal, Kindergarten–Primary Certificate, Class of 1922.

Rating.	Name.	Certificate Expires.
806	Mary D. FitzGerald	June 30, 1928
805	Helen R. Dempsey	" 30, 1928
798	Eleanor R. Kiernan	" 30, 1928
790	Catherine M. Herbert	" 30, 1928
789	Margaret R. McLaughlin	" 30, 1928
778	Margaret E. Devine	" 30, 1928
767	Loraine L. Wright	" 30, 1928
748	Julia V. Dee	" 30, 1928
738	Henrietta W. Sheinker	" 30, 1928

Kindergarten Certificate.

Examined Candidates.

946	Gladys O. Bolton	June 30, 1928
914	Marguerite Davison	" 30, 1928
833	Marjorie Williams	" 30, 1928
819	Marian M. Scarr	" 30, 1928
812	Julia F. McInerney	" 30, 1928
776	I. Mae Wiles	" 30, 1928
767	Marion A. Waldron	" 30, 1927

Kindergarten Certificates — Concluded.

Rating.	Name.	Certificate Expires
766	Louise J. Dole	June 30, 1928
765	Margaret M. Brine	" 30, 1928
764	Mary Connelley	" 30, 1928
757	Helen M. Coleman	" 30, 1924
738	Mabel F. Cullen	" 30, 1927
737	Ina Strauss	" 30, 1928
719	Marguerite C. Sullivan	" 30, 1928
711	Marie I. Daly	" 30, 1928
709	Gertrude Cavanagh	" 30, 1928
701	Winifred S. O'Brien	" 30, 1928

SPECIAL CERTIFICATES VALID IN DAY ELEMENTARY SCHOOLS.

Cookery.

Rating.	Name.	Certificate Expires
884	Esther J. Hawkes	June 30, 1928
840	Madeline H. Murdoch	" 30, 1928

Sewing.

842	Helen Rowell	June 30, 1927
772	Helen B. Cunningham	" 30, 1928
766	Theresa E. Morrison	" 30, 1928
751	Dorothy E. Reilly	" 30, 1928

Manual Training.

Foreman, shop work.

Rating.	Name.	Certificate Expires
829	Harold R. Wise	June 30, 1928
818	Edward W. Malone	" 30, 1926
785	Frederick E. Rau	" 30, 1926

Instructors.

872	Emerson Staebner	June 30, 1928
787	Graton G. Howland	" 30, 1928
770	Gunnar Munnick	" 30, 1928
762	John F. Cook	" 30, 1928
756	Henry G. Wendler	" 30, 1928
741	Raymond F. Higgins	" 30, 1928
740	Edwin C. Andersen	" 30, 1928
715	Alvin J. Long	" 30, 1924

Modeling.

755	L. Reginald Chandler	June 30, 1928

Prevocational assistants.*

812	I. Virginia Lyons	June 30, 1924
802	Sadie M. Knight	" 30, 1924

* See, also, Prevocational Assistants, page 28.

SPECIAL CLASS CERTIFICATES.

First Assistant in Charge.

Rating.	Name.	Certificate Expires
726	Florence E. Hosmer	June 30, 1924

Instructors.

875	Gladys P. Douglas	June 30, 1928
823	Dorothy L. Sullivan	" 30, 1928
821	Ann W. Quigley	" 30, 1928
806	Margaret M. Flaherty	" 30, 1924
804	Dorothy M. Shea	" 30, 1928
775	Mary E. King	" 30, 1928
761	Blanche W. Crowell	" 30, 1928
741	May B. Dodge	" 30, 1925
728	Frances M. Hagerty	" 30, 1928

ASSISTANT PRINCIPAL, HORACE MANN SCHOOL FOR THE DEAF CERTIFICATE.

Rating.	Name.	Certificate Expires
864	Elsa L. Hobart	June 30, 1926
702	Sarah W. Jenkins	" 30, 1926

CONTINUATION SCHOOL CERTIFICATE.

Instructors.

Rating.	Name.	Certificate Expires
863	Patrick J. Donovan	June 30, 1928
846	John J. Quinn, Jr.	" 30, 1928

Assistants.

909	Anna M. Killion	June 30, 1925
864	Julia E. Fletcher	" 30, 1925
862	Josephine Shanahan	" 30, 1925
856	Mary E. Flaharan	" 30, 1925
855	Julia A. Barrett	" 30, 1925
855	Grace D. Fisher	" 30, 1924
855	Anne Sheridan	" 30, 1924
836	M. Elizabeth Gay	" 30, 1925
823	M. Theresa O'Hare	" 30, 1924
820	Mary A. Kennedy	" 30, 1925
820	Mary C. Murphy	" 30, 1923
816	Emma A. Sellew	" 30, 1923
814	Anastasia K. White	" 30, 1924
812	Viola K. Murray	" 30, 1928
808	Margaret M. Casey	" 30, 1924
774	Elizabeth H. Flaharan	" 30, 1925
720	Josephine F. Hagarty	" 30, 1923

Continuation School Certificate — Concluded.

PREVOCATIONAL ASSISTANTS.†

Rating.	Name.	Certificate Expires
915	Mary O. Nolan	June 30, 1928
908	Anne Mackenzie	" 30, 1928
903	Mary A. Starkey	" 30, 1926
868	Arvilla T. Harvey	" 30, 1928
862	Grace M. Broaders	" 30, 1928
862	Anna F. Cotter	" 30, 1926
807	Alice M. Colleton	" 30, 1926
805	Mary A. Hartigan	" 30, 1927
755	Mary E. Doyle	" 30, 1928

DAY CLERICAL SCHOOL CERTIFICATE.

CLERICAL ASSISTANT.

Rating.	Name.	Certificate Expires
826	Marion A. Fitch	June 30, 1928

DAY AND EVENING INDUSTRIAL SCHOOLS CERTIFICATES.

XXX.—(SHOP INSTRUCTORS, HELPERS, AND TRADE ASSISTANTS IN DAY OR EVENING INDUSTRIAL, CONTINUATION, INTERMEDIATE, OR PREVOCATIONAL SCHOOLS OR CLASSES AND XXXI.—TECHNICAL INSTRUCTORS.)

AUTO MECHANICS.

Rating.	Name.	Certificate Expires
752	Garrett J. P. Flanagan	June 30, 1926
746	Charles M. McKenzie	" 30, 1927

CABINETMAKING.

767	Charles J. Rodgers	June 30 1924
700	Arvid J. Wahlstrom	" 30, 1928

DRAFTING.

861	Carl H. Oquist	June 30, 1928
700	Arthur G. Hamilton	" 30, 1928

DRESSMAKING.

855	Helen MacNeil	June 30, 1928
841	Lucille A. Bouchard	" 30, 1924
790	Mary A. O'Brien*	" 30, 1923
762	Millicent Edwards	" 30, 1928

ELECTRICITY.

825	Vashni M. Marchant	June 30, 1928
819	Nils Engstrom	" 30, 1923
791	John Y. Murray	" 30, 1927
778	Alanson O. Dawes	" 30, 1928
764	George G. Noren	" 30, 1925
751	John F. Fitzsimmons	" 30, 1926
750	Daniel L. Kenslea	" 30, 1926

* Holds XXXI. (Technical Instructor) certificate only.

† See, also, Prevocational Assistants, page 26.

Day and Evening Industrial Schools Certificates — Continued.

MACHINE OPERATING.

Rating.	Name.	Certificate Expires
796	Sarah G. McGee	June 30, 1927

MACHINE SHOP PRACTICE.

893	Percy E. Collins	June 30, 1923
814	Albert J. Pfau	" 30, 1928
791	James R. Conners	" 30, 1928
791	Edward A. Mason	" 30, 1927
755	John H. Farrell	" 30, 1924
725	Hugh J. Eisenhauer	" 30, 1924
715	Henry J. McKinnon	" 30, 1928

MILLINERY.

875	Alice A. Alden	June 30, 1923
752	Marie C. Turner	" 30, 1926

PATTERNMAKING.

857	George E. Shepherd	June 30, 1928
854	Louis A. Van Ham	" 30, 1928
846	Joseph Hackett	" 30, 1926
836	Alexander F. Rowe	" 30, 1928
770	Albert E. Clarkson	" 30, 1928
767	Robert S. Waite	" 30, 1926
700	Clarence E. Damon	" 30, 1928

PRINTING.

885	Charles R. Forbes	June 30, 1923
841	Ralph L. Boudreau	" 30, 1923
831	John B. Martell	" 30, 1923
798	Cyril W. Shovelier	" 30, 1928
796	John A. Rice	" 30, 1928
757	Charles R. O'Malley	" 30, 1926
738	Thomas F. Woods	" 30, 1924

SHEET METAL WORK.

791	Matthew T. Cavanaugh	June 30, 1924

XXXI.—A. (Heads of Departments, Both Shop and Academic, in the Trade School for Girls; Shop Foreman in Day and Evening Industrial, Continuation, Intermediate, or Prevocational Schools or Classes.)

AUTO MECHANICS.

Rating.	Name.	Certificate Expires
825	Cornelius T. Curtin	June 30, 1928
717	Samuel R. Romano	" 30, 1928

CABINETMAKING.

783	Alden T. Stubbs	June 30, 1925

Day and Evening Industrial Schools Certificates — Concluded.

DRAFTING.

Rating.	Name.	Certificate Expires
789	Albert H. Hanly	June 30, 1928
774	Albert C. Dove	" 30, 1928

ELECTRICITY.

858	Charles F. L'Hommedieu	June 30, 1928
781	Francis R. Sheehan	" 30, 1928

MACHINE OPERATING.

729	Bertha D. Tucker	June 30, 1927

MACHINE SHOP PRACTICE.

849	Joseph P. Shea	June 30, 1926
757	Carl E. Janson	" 30, 1925
736	William J. Doherty	" 30, 1925
735	Grover C. Russell	" 30, 1925

PRINTING.

889	Allan Robinson	June 30, 1924
712	Frederick G. E. Zeidler	" 30, 1925

XXXI.— B. (Division Heads and Shop Superintendents in the Boston Trade School; Co-operative Instructors and Co-ordinators in Day High Schools; Division Foremen and Heads of Divisions in the Continuation School.)

AUTO MECHANICS.

Rating.	Name.	Certificate Expires
774	Warren C. Burnham	June 30, 1928

CABINETMAKING.

749	Harold P. Johnson	June 30, 1926
701	Frederick E. Rau	" 30, 1927

DRAFTING.

830	Percy A. Brigham	June 30, 1925
813	Walter H. Naylor	" 30, 1926
736	Arthur R. Nelson	" 30, 1928

MACHINE SHOP PRACTICE.

849	William J. Doherty	June 30, 1928
833	Abraham S. Burnes	" 30, 1928

PRINTING.

840	Allan Robinson	June 30, 1924
833	Patrick J. Smith	" 30, 1927
811	William P. Grady	" 30, 1928
716	Frederick L. Eames	" 30, 1926

XXXIV. TEACHERS OF PHYSICAL TRAINING IN DAY AND EVENING INDUSTRIAL SCHOOLS.

Rating.	Name.	Certificate Expires
821	Alice B. Felton	June 30, 1924

ASSISTANT DIRECTOR OF MANUAL ARTS CERTIFICATE.

Rating.	Name.	Certificate Expires
854	George F. Hatch	June 30, 1928
838	Ralph W. Babb	" 30, 1928

ASSISTANT IN MANUAL ARTS CERTIFICATE.

CORRELATION.

Rating.	Name.	Certificate Expires
898	Loretta J. Curran	June 30, 1928

DRAWING.

878	Mary P. Barry	June 30, 1926
814	Annette M. Lavoie	" 30, 1924
780	Amy E. Adams	" 30, 1924
762	Grace M. Stack	" 30, 1924
743	Maud J. Bray	" 30, 1927
740	Josephine G. Malone	" 30, 1924
730	Florence F. Cooper	" 30, 1926
725	Hannah E. McDonough	" 30, 1926

ASSISTANT DIRECTOR OF MUSIC CERTIFICATE.

Rating.	Name.	Certificate Expires
931	Daniel D. Tierney, Jr.	June 30, 1928

ASSISTANT IN MUSIC CERTIFICATE.

Rating.	Name.	Certificate Expires
884	Gertrude A. Smith	June 30, 1928
787	Mildred Martin	" 30, 1926
755	Alma D. Holton	" 30, 1926
721	Helen J. Lynch	" 30, 1928
716	Agnes F. McCarthy	" 30, 1928

INSTRUCTOR OF MILITARY DRILL CERTIFICATE.

Rating.	Name.	Certificate Expires
849	Forrest B. Moulton	June 30, 1925
843	Edward FitzGerald	" 30, 1928
839	William J. McCluskey	" 30, 1927
809	Charles B. McCarthy	" 30, 1928
792	Robert A. O'Neill	" 30, 1925
786	Albert J. Kelley	" 30, 1928
753	George F. A. Mulcahy	" 30, 1925
704	Franklyn J. Burbank	" 30, 1928
701	Eugene E. Stowell	" 30, 1928

SCHOOL NURSE CERTIFICATE.

Rating.	Name.	Certificate Expires
833	Madeline V. Finnigan	June 30, 1928
824	Miriam B. Downing	" 30, 1926
822	Della V. Egan	" 30, 1926
809	Anna E. Donovan	" 30, 1928
801	Mary E. M'Keown	" 30, 1925
784	Eleanor A. Tobin	" 30, 1928
779	Katharine Reid Sullivan	" 30, 1927
777	Anna A. Ramsey	" 30, 1928
776	Margaret T. Linehan	" 30, 1928
774	Veronica T. Cashin	" 30, 1926
771	Rose A. Murphy	" 30, 1928
770	Elsie R. Morley	" 30, 1928
766	Ethel Benjamin Gabriel	" 30, 1925
756	Anna Gallagher	" 30, 1928
754	Mary Nolan Dee	" 30, 1924
737	Katherine A. Grady	" 30, 1926
734	Olive M. Houghton	" 30, 1923
730	Lucy T. O'Kane	" 30, 1927
723	Julia G. Cronin	" 30, 1928
700	Dora E. Manning	" 30, 1925
692	Gertrude A. Lambert	" 30, 1927
688	Frances E. Grasse	" 30, 1925
682	Mary E. Wilson	" 30, 1927

ALPHABETICAL LIST OF CANDIDATES.

(Unless otherwise indicated, all addresses are in Massachusetts.)

A.

		Page
Adams, Amy E	5 Jefferson street, Newton	31
Carl H	57 Groveland street, Haverhill	17
Charlotte L	3 Frothingham avenue, Charlestown	20
Alden, Alice A	22 Freeman street, Arlington	29
Alexander, Margaret	428 Meridian street, East Boston	13
Anderson, Edith E	103 Lonsdale street, Dorchester	20
Edwin C	29 Beach street, Dorchester	26
Elna C	357 Charles street, Boston	18
Austin, Lillian H	147 Washington street, Marblehead	16
May M	Portland, Conn	16
Avery, Bernecia E	11 Dana street, Cambridge	25
Aznive, Grace N	18 Ballou place, Dorchester Centre	17

B.

Babb, Ralph W	29 Basset street, Lynn	31
Babson, Alice E	121 Mt. Pleasant avenue, Gloucester	13
Bacciola, Nella	115 Neptune road, East Boston	21
Baker, Kenrick M	53 Wendell avenue, Brockton	17
Barlow, Maude Welch	178 Huntington avenue, Boston	14
Barr, Frances I	139 Highland street, Roxbury	20
Barrett, Julia A	40 Prospect avenue, Norwood	27
Mary A	84 Milton street, Dorchester	20
Barry, George F	596 East Fourth street, South Boston	23
Mary P	16 Dunwell street, West Roxbury	31
Bassett, Mary A	95 Hillcrest avenue, Worcester	24
Beebe, Katherine M	4 Franklin terrace, Hyde Park	22
Berg, Eleanor	128 King street, Dorchester	14
Beveridge, Helen	24 Nixon street, Dorchester	13
Billings, Constance	22 Burroughs street, Jamaica Plain	13
Birrell, Ethel J	193 Hamilton street, Dorchester	20
Bolton, Gladys O	26 Dunreath street, Roxbury	25
Bouchard, Lucille A	176 Norfolk street, Wollaston	28
Boudreau, Ralph L	32 Bayfield road, Atlantic	29
Boyan, John J	175 Princeton street, East Boston	22
Bradford, Edith H	272 Summer street, West Somerville	14
Bragdon, Ralph H	123 North avenue, North Abington	15
Brawley, Evelyn M	22 Lambert street, Roxbury	16
Bray, Maud J	2047 Columbus avenue, Roxbury	31
Brennan, John J	58 Dustin street, Brighton	14
Bresnahan, Dorothy E	398 Essex street, Salem	17
Bresth, Jennie	109 Washington avenue, Chelsea	24
Brigham, Percy A	22 Madison street, Somerville	30
Brine, Margaret M	2262 Sedgwick avenue, New York City	26
Broaders, Grace M	11 Dearborn street, Medford Hillside	28
Brogan, Mary C	192 Grant avenue, Medford	19
Bryan, Ellen E	7 Wallace court, Charlestown	21
Burbank, Franklyn J	Box 196, Livermore Falls, Me.	31
Burke, Abigail F	14 Mark street, Roxbury	22
Alfred F	112 Magazine street, Cambridge	17
Gertrude M	57 Rogers street, West Quincy	23

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Burnes, Abraham S.	43 Chambers street, Boston	30
Burnham, Warren C.	116 Warren street, Brighton	30
Burns, Helen E.	2 Concord street, Natick	24
Margarita E.	11 Emerald street, Hingham	24
Paulina V.	30 Whiting street, Roxbury	22
Thomas P.	230 Park street, Dorchester	13
Burt, Walter F.	180 Grasmere avenue, Fairfield, Conn.	15
Busiek, Kurt G.	213 Savin Hill avenue, Dorchester	15

C.

Cagney, Katharine E.	556 Main street, Bridgewater	24
Cahill, Anna L.	14 Newbern street, Jamaica Plain	17
Callanan, Natalie Taylor.	175 West Brookline street, Boston	24
Campion, Frances R.	10 Mallon road, Dorchester	13
Card, John H.	31 Elm avenue, Brockton	15
Carey, Helen.	15 Allen street, Boston	22
Carnegie, Marion L.	77 Gustine street, Dorchester	20
Carney, Frederick L.	46 Westbourne road, Forest Hills	13
Carr, Alice G.	34 Franklin street, Woburn	16
Carroll, Elizabeth D.	17 Old Harbor street, South Boston	21
Carven, Agnes M.	56 Baldwin street, Charlestown	18
Casey, Margaret M.	89 Cedar street, Roxbury	27
Cashin, Veronica T.	48 Hartford street, Dorchester	32
Cavanagh, Gertrude.	19 Richmond street, Dorchester	26
Cavanaugh, Matthew T.	94 Central avenue, Medford	29
Cederberg, Charles A.	18 Stevens street, Medford Hillside	16
Chandler, L. Reginald.	44 Eliot street, Jamaica Plain	26
Chapin, Dorothy A.	11 Mystic street, Somerville	15
Chesley, Marion.	18 Chandler street, Boston	14
Chisholm, Angus J.	62 Beacon street, Arlington	19
Chofnas, Eva.	40 Woodcliff street, Roxbury	20
Christie, Sarah H.	4 Fordham Court, Jamaica Plain	22
Clark, Elizabeth A.	8 Bowden street, Marblehead	24
Clarkson, Albert E.	1 Maple Leaf road, Worcester	29
Cogan, Matilda E.	61 Farragut road, South Boston	17
Cohen, Sophia B.	214 Bremen street, East Boston	18
Coleman, Helen M.	59 Esmond street, Dorchester	26
Theresa V.	59 Esmond street, Dorchester	19
Colleton, Alice M.	20 Charlesgate West, Boston	28
Collins, Percy E.	West Auburn	29
Connelley, Mary.	80 Esmond street, Dorchester	26
Conners, James R.	18 Greenhalge avenue, Everett	29
Connor, Anastasia B.	74 Harvard avenue, Allston	14
Christopher A.	322 Hyde Park avenue, Jamaica Plain	19, 22
Conroy, Agnes T.	475 East Fifth street, South Boston	19
Conway, Margaret V.	1 Sachem street, Roxbury	21
Cook, John F.	34 Union street, Lebanon, N. H.	26
Cooper, Florence F.	250 Grove street, Melrose	17, 31
Corrigan, Helen M.	72 St. Stephen street, Boston	22
Costello, Evelyn D.	2 Endicott terrace, Dorchester	22
Cotter, Anna F.	56 Claybourne street, Dorchester	28
Coughlan, Katherine M.	901 Hancock street, Wollaston	24
Courchene, William A.	44 Central avenue, Hyde Park	17
Creedan, Catherine E.	Elm street, Hopkinton	13, 16
Cremins, Anna L.	81 Garfield street, Quincy	24
Cronin, Julia G.	27 Juliette street, Dorchester	32
Margaret A.	49 Farragut road, South Boston	17
Crosson, Wilhelmina M.	28 Greenwich park, Boston	25
Crowell, Blanche W.	51 Church street, Rockland	27
Cudmore, Dorothy G.	145 Sycamore street, Somerville	25
Cullen, Mabel F.	7 Austin street, Hyde Park	26
Cunningham, Helen B.	39 River Ridge, Wellesley (P. O.), Newton Lower Falls	26

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Curran, Loretta J.	51 Brown avenue, Roslindale	31
Curtin, Cornelius T.	6 Porter road, North Cambridge	29
Cushing, Lester H.	495 Wilder street, Lowell	14
Cutler, Gertrude P.	11 Maple avenue, Newton	25

D.

Dacey, Mildred A.	18 Muzzey street, Lexington	18
Daly, Marie I.	320 Dudley street, Roxbury	26
Damon, Clarence E.	59 Pleasant street, Worcester	29
Davis, Mary A.	24 Folsom street, Dorchester	14
Davison, Marguerite	95 Brooks street, Brighton	25
Dawes, Alanson O.	51 Linden street, Everett	28
Day, Marie O.	22 Westview street, Dorchester	21
Dee, Julia V.	104 G street, South Boston	21, 25
Mary Nolan	9 Bellflower street, Dorchester	32
William J., Jr.	104 G street, South Boston	19
deHaro, Virginia K.	2709 Washington street, Roxbury	21
Dempsey, Helen R.	10 Ruthven street, Roxbury	20, 25
Derry, Cecil T.	12 Trowbridge street, Cambridge	16
Devery, Alice L.	Canton street, Dedham	24
Devine, Margaret E.	38 Brookford street, Dorchester	21, 25
Devlin, Elizabeth S.	6 Williams park, Dorchester	20
Diack, Eva O.	47 Independence avenue, Quincy	24
Dodge, May B.	56 Green street, Brockton	27
Doggett, Agnes G.	Sandy Valley, Dedham	18
Doherty, Mary E.	46 Adams street, Dorchester	16
William J.	4 Mt. Vernon avenue, Charlestown	30
Dole, Louise J.	4 Rockland street, Roxbury	26
Donahoe, Joseph A.	11 Stone street, Charlestown	19
Donahue, Richard G.	11 Centre avenue, Dorchester	19
Donnelly, Anna H.	24 Wyman street, Jamaica Plain	20
Thomas A.	58 Chadwick street, Roxbury	13
Donovan, Anna E.	24 Murdock street, Brighton	32
Bernard F.	108 Austin street, Cambridge	14
James A.	90 West Sixth street, South Boston	23
May A.	55 Marion street, Natick	24
Patrick J.	28 Oakview terrace, Jamaica Plain	27
Douglas, Gladys P.	408 North Main street, Andover	27
Dove, Albert C.	119 Walnut avenue, Roxbury	30
Dow, Albert J.	Y. M. C. A., Huntington avenue, Boston	15
Dowd, Winifred A.	9 Atherstone street, Dorchester	18
Downing, Miriam B.	24 St. Mary's street, Boston	32
Doyle, Bertha R.	348 Belmont street, Watertown	24
Mary E.	4 Enfield street, Jamaica Plain	28
Drake, Beatrice E.	67 Brook street, Wollaston	24
Dreney, Sara B.	42 Tennyson street, Boston	16
Duane, Abbie M.	5 Bryant avenue, West Quincy	25
Dubois, Aldege J.	76 Francis street, Boston	14
Duff, May J.	5 Dexter row, Charlestown	15
Duffey, Ellen L.	Box 57, Hopkinton	13
Dunn, John A.	138 Myrtle street, Rockland	14
Dwyer, Mary I.	1 Rogers place, Salem	22

E.

Eagan, Elsie F.	71 Fletcher street, Roslindale	24
Eames, Frederick L.	94 Locust street, Winthrop	30
Edwards, Millicent.	20 Coral avenue, Winthrop	28
Egan, Della V.	481 Central avenue, Needham Heights	32
Eisenhauer, Hugh J.	64½ Prospect street, Cambridge	29
Ellis, Dorothy M.	116 Thorndike street, Brookline	19
Madeline M.	116 Thorndike street, Brookline	18
Engstrom, Nils.	26 Coombes street, Southbridge	28

F.

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Farnsworth, Ray D	High street, Ashland	15
Farrell, John H	78 Winthrop avenue, Revere	29
Felton, Alice B	20 Woodford street, Dorchester	31
Fihelly, James E	290 Reed street, Rockland	19
Finnigan, Madeline V	2033 Columbus avenue, Roxbury	32
Finnin, Marion J	437 Broadway, Somerville	24
Fischer, Florence M	11 Everdean street, Dorchester	20
Fisher, Grace D	58 Wyman street, Woburn	27
Fitch, Marion A	46 Hereford street, Boston	28
FitzGerald, Edward	133 Elm street, Cambridge	31
Mary D	1 Amory terrace, Roxbury	20, 25
Fitzgerald, Helen M	44 Chester street, Wollaston	14
Marion E	196 Hampden street, Roxbury	14
Fitzsimmons, John F	25 Morse street, Newton	28
Flaharan, Elizabeth H	27 Maple avenue, Cambridge	27
Mary E	27 Maple avenue, Cambridge	27
Flaherty, Margaret M	104 Cedar street, Roxbury	27
Flanagan, Garrett J. P	33 Hawthorne street, Roxbury	28
Fleming, Bertha L	6 Raven street, Dorchester	20
M. Elizabeth	8 Springer street, South Boston	21
Fletcher, Julia E	8 Mason street, Malden	27
Forbes, Charles R	18 Ashton street, Worcester	29
Ford, Marion McIntyre	32 Templeton street, Dorchester	17
Fossett, Gertrude M	36 Brent street, Dorchester	17
Fowles, Elinor J	28 Lindsey street, Dorchester	18, 22
Foye, Harold B	66 Alban street, Dorchester	16
Frazier, Elliott P	5 Ireson avenue, East Lynn	15

G.

Gabriel, Ethel Benjamin	188 Dean street, Taunton	32
Gallagher, Anna	2 Hartford street, Roxbury	32
Galvin, Alice L	163 Whitwell street, Quincy	25
Thomas F	18 Boynton street, Jamaica Plain	13
Garrity, Mary Sullivan	9 Brown avenue, Roslindale	22
Gay, M. Elizabeth	469 Adams street, Dorchester	27
Giblin, Mary M	37 Mayfield street, Dorchester	15
Gilbert, Frank A	72 Inman street, Cambridge	19
Gill, Edward J	12 Ernst street, Roxbury	18
Gilligan, Alice C	411 Main street, Medford	24
Gilman, Marion C	21 Pelham street, Boston	19
Gilmore, Gladys C	80 Madison avenue, Newtonville	17
Given, Frances W	83 Bedford road, Woburn	14
Glover, Clara E	22 Brown avenue, Roslindale	17
Gorman, Dorothy M	27 Queen street, Worcester	18
Gould, Caroline A	22 Worthington street, Boston	21
Grady, Katherine A	1415 Commonwealth avenue, Allston	32
William P	26 Winslow street, Roxbury	30
Grasse, Frances E	84 School street, Charlestown	32
Greene, Vincent L	50 Thomas park, South Boston	14
Gregory, Helen Judge	Box 43, Bondsville	24
Grenier, Lucie M	98 Palmer street, Quincy	22
Griffin, Viola M	40 Ivory street, West Roxbury	20
Gross, William J	10 Cottage park, Dorchester	13

H.

Hackett, Joseph	63 Cushing street, Cambridge	29
Hagarty, Josephine F	27 Richards street, Worcester	27
Hagerty, Frances M	66 Arlington road, Woburn	27
Haggerty, Harriet A	16 Buckminster street, Boston	24
Mary C	Bennett street, East Pepperell	23
Halbritter, Gertrude D	1 Lindsey street, Dorchester	13

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Halligan, Henry M. J.	927 East Fourth street, South Boston	19
Hamilton, Arthur G.	143 Langdon avenue, Watertown	28
Margaret F.	77 Eustis street, Revere	24
Hampe, Elisabeth M.	37 Dunster road, Jamaica Plain	17
Hanley, Catherine M.	66 Raymond street, East Weymouth	24
Hanly, Albert H.	48 Flynt street, Norfolk Downs	30
Hanson, Pearl B.	95 Union street, South Weymouth	25
Harris, Ellen L.	9 Linden street, Mansfield	24
Hartford, Nina B.	30 Winthrop street, Chelsea	24
Hartigan, Mary A.	80 Brown avenue, Roslindale	28
Harvey, Arvilla T.	51 Hyde street, Newton Highlands	28
Isabelle M.	81 O street, South Boston	20
Hassett, Marie G.	18 Rockland street, Roxbury	25
Hatch, George F.	125 Corey street, Boston 32	31
Hollis D.	34 Fairmont avenue, Waltham	15
Hawkes, Esther J.	15 Durham street, Boston	26
Heagney, Catharine L.	32 Sewall street, Winter Hill	23
Healey, Mary H.	63 Paul Gore street, Jamaica Plain	23
Healy, Joseph F. X.	688 Massachusetts avenue, Boston	19
Hendrick, Frances M.	330 Newtonville avenue, Newtonville	25
Herbert, Catherine M.	131 Circuit road, Winthrop	20, 25
Herlihy, Mildred K.	Franklin Square House, Boston	25
Higgins, Raymond F.	Lincoln street, North Easton	26
Hinckley, Wilfred N., Jr.	Dean Academy, Franklin	13
Hinkley, Margaret H.	124 Bradley street, Hyde Park	25
Hobart, Elsa L.	18 Park drive, Brookline	27
Hoey, Thomas J.	58 Frederic street, Framingham	15
Hoffman, Rae F.	808 Blue Hill avenue, Dorchester	17
Holmes, Fred.	39 Mayflower street, Plymouth	15
Lilian.	28 Parsons street, Brighton	14
Holteen, Julia A.	24 Gothland street, Quincy	13
Holton, Alma D.	52 Waite street, Malden	31
Hosmer, Florence E.	34 Noble avenue, Westfield	27
Houghton, Olive M.	173 Bellevue avenue, Melrose	32
Hourihan, Mary A.	26 Mather street, Dorchester	18
Howard, Lawrence A.	93 St. Botolph street, Boston	15
Howland, Gladyce L.	446 Massachusetts avenue, Boston	24
Graton G.	195 Huntington avenue, Boston	26
Hoy, Ellen C.	106 Greenbrier street, Dorchester	14
Hurley, Agnes G.	Westminster Hotel, Boston	25

I.

Ireland, Mary S.	86 Walker road, Swampscott	23
Irons, Gordon F.	82 Green street, Charlestown	18

J.

Janson, Carl E.	7 Elm street, Hyde Park	30
Jenkins, Sarah W.	Ashland	27
Jewett, John V.	6 Webster court, Stoneham	14
Johnson, Annie C.	31 Walden street, Concord	16, 24
Harold P.	192 White street, Waverley	30
Jones, Charles.	Lock Box 215, Bridgton, N. J.	13

K.

Keep, Mary E.	63 West Cedar street, Boston	20
Kees, Helena M.	27 Ainsworth street, Roslindale	17
Kelleher, Mary E.	156 Auburn street, Brockton	25
Kelley, Agnes E.	42 Highland street, Roxbury	18
Albert J.	103 Aldrich street, Roslindale	31
Kendall, Harold L.	11 Grove avenue, Westerly, R. I.	22, 23
Kennedy, Bessie E.	12 Thomas park, South Boston	22
Doris S.	73 Nightingale street, Dorchester	21
Edwin C.	31 Larchmont street, Dorchester	19

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Kennedy, Grace H.	43 Dartmouth street, Somerville	16
Mary A.	30 Park avenue, South Weymouth	27
Kenney, Gertrude V.	49 Wayland street, Dorchester	21
Kenslea, Daniel L.	44 Capitol street, Watertown	28
Kiernan, Eleanor R.	307A Warren street, Roxbury	20, 25
Kiggen, Helen J.	54 Austin street, Hyde Park	17
Killion, Anna M.	143 Tremont street, Malden	23, 27
Mary B.	1326 North street, Westwood	16
King, Agnes C.	1 Highland street, Marlboro	24
Mary E.	11 Frederick road, South Braintree	27
Kirby, Helen F.	47 East Concord street, Boston	20
Knight, Sadie M.	3 Rosemere court, Roslindale	26
Knowlton, S. Margaret	20 Auburn street, Malden	24
Koziewicz, Felicia A.	2679 Washington street, Roxbury	21
Kupelian, Marie J.	47 East Concord street, Boston	20

L.

Lally, Francis J.	460 East Seventh street, South Boston	16
Lamb, Margaret V.	34 Crescent street, Somerville	24
Lambert, Gertrude A.	46 Francis street, Boston	32
Lavoie, Annette M.	3 Harvard avenue, Waltham	31
Leidner, Walter E.	46 Cranston street, Boston 30	13
Lewis, Earl S.	59 Davis avenue, Auburn, Me.	14
L'Hommedieu, Charles F.	19 Bellingham avenue, Everett	30
Linehan, Margaret T.	63 Florence street, Brockton	32
Little, Christina S.	274 Princeton street, East Boston	15
Lombard, Clarence W.	Weston	15
Long, Alvin J.	Fairhaven High School, Fairhaven	26
Loschi, Margaret M.	115 Neptune road, East Boston	25
Loveland, Winslow H.	29 Lincoln street, Hyde Park	13
Lundin, Enor E.	89 Glendale road, Quincy	15
Lyman, Katherine H.	1 Prentice avenue, Milford	24
Lynch, Agnes M.	32 Mystic street, Charlestown	20
Helen J.	101 Parsons street, Brighton	31
Margaret A.	129 Pleasant street, Dorchester	20
Lyons, Dorothy M.	403 High street, Dedham	21
I. Virginia	Lynnfield Centre	26

M.

MacKay, Marian	49 Fairbanks street, Brighton	20
Mackenzie, Anne	5 Upham avenue, Dorchester	28
Mack, William F.	50 Brush Hill road, Milton	23
MacMillan, Adelia	611 Walnut street, Fall River	14
MacNeil, Helen	18 Naples road, Brookline	28
Madden, Marie R.	42 Johnson street, Ansonia, Conn.	14
Regina D.	72 Pearl street, Framingham	16
Madigan, Francette E.	26 Myrick street, Allston	21
Mahaney, E. Beatrice	6 Victoria street, Dorchester	14
Mahoney, Frederick L.	101 Whitin avenue, Revere	23
William F.	79 East Lincoln street, Marlboro	22, 23
Maley, Theresa B.	Teachers' College, Detroit, Mich.	17
Mallard, Mary M.	11 Juliette street, Dorchester	20
Malone, Edward W.	82 Fuller street, Dorchester	26
Josephine G.	27 Clarkwood street, Mattapan	31
Maloney, Grace K.	358 Geneva avenue, Dorchester	20
Mary G.	145 Neponset avenue, Dorchester	20
Manning, Dora E.	81 Benton road, Somerville	32
Marie J.	11 Samoset street, Dorchester	21
Mansur, Frank L.	835 East street, Walpole	14
Marchant, Vashni M.	19 Hobson street, Boston	28
Martell, John B.	127 London street, East Boston	29
Martin, Mildred	87 Tudor street, Chelsea	31
Mason, Edward A.	63 Tonawanda street, Dorchester	29

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Matson, Eleanor H.	512 Beulah street, Whitman	22
Matthes, Mary C.	20 Lee street, Jamaica Plain	21
McAuliffe, Mary F.	4 Melrose street, Boston	22
McCabe, George S.	East Walpole	22
McCarthy, Agnes F.	40 Harvard street, Boston 11	31
Charles B.	State Police Patrol, Northampton	31
George F.	1 Bancroft street, Roxbury	16
Julia J.	36 Washington street, Charlestown	20
Mildred A.	355 Main street, Lewiston, Me.	17
McCarty, Katherine E.	10 Nottingham street, Dorchester	17
McCluskey, William J	43 H street, South Boston	31
McCormack, John W.	1095 Boulevard E., West N. Y., N. J.	15
McCormick, Lillian M.	135 Marcella street, Roxbury	21
McDermott, Mary T.	74 Williams street, Jamaica Plain	17
McDonough, Hannah E.	37 Lindsey street, Dorchester	31
McGann, Florence C.	22 Nelson street, Dorchester	17
McGee, Sarah G.	18 Catawba street, Roxbury	29
McGinty, Catharine A.	355 N. Main street, Pawtucket, R. I.	24
McGrath, Bernard H.	91 Liberty street, Rockland	19
McHale, Ruth E.	15 Avon street, Stoneham	19
McInerney, Julia F.	140 Highland avenue, Arlington	25
McKelligett, Marguerite	Hotel Grossman, Clinton	14
McKenna, Agnes C.	115 Dale street, Roxbury	17
Helen G.	1304 Hyde Park avenue, Hyde Park	23
McKenney, William V.	130 N. Harvard street, Allston	14
McKenzie, Charles M.	764 Morton street, Dorchester	28
McKinnon, George L.	80 Stetson street, Whitman	23
Henry J.	254 Brookline street, Cambridge	29
McLaughlin, Alice M.	96 Homer street, East Boston	21
Margaret R.	34 Darling street, Roxbury	20, 25
McMahon, Mary A.	370 Washington street, Brookline	14
McManus, Francis R.	1735 Willard street, N. W., Washington, D. C.	22
McNamara, Evelyn G.	66 Freeman street, Arlington	14
Mary L.	51 Mt. Vernon street, Fitchburg	23
McQuaid, Mary C.	1154 Fellsway, Malden	24
McQueeney, Agnes L.	333 Park street, Dorchester	22
Mealy, Matthew F.	23 Toxteth street, Brookline	15
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SCHOOL DOCUMENT NO. 5—1922

BOSTON PUBLIC SCHOOLS

GENERAL SCIENCE FOR INTERMEDIATE CLASSES

PAMPHLET No. 8—A STUDY OF AIR AND VENTILATION

BOSTON
PRINTING DEPARTMENT
1922

In School Committee, Boston, June 5, 1922.

Ordered, That the two accompanying pamphlets of a series of courses in science for intermediate schools and classes,

No. 8. A Study of Air and Ventilation,
No. 9. A Study of the Weather,

are hereby authorized to be printed as school documents.

Attest:

THORNTON D. APOLLONIO,
Secretary.

[1,000-7-11-'22.]

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GENERAL SCIENCE FOR INTERMEDIATE CLASSES.*

This outline of work has been prepared by a council, comprising teachers in the high, intermediate, and elementary schools of the city, under the supervision of Mr. Arthur L. Gould, Assistant Superintendent. The members of the council are as follows:

Joseph R. Lunt, *Chairman* .	English High School.
George W. Gammon, *Secretary.*	John Marshall School.

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Charles H. Stone, Jr. . .	English High School.
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Adelbert H. Morrison . .	Mechanic Arts High School.
Dennis C. Haley	Roxbury High School.
Lillian J. MacRae . . .	South Boston High School.
Thomas P. Dooley . . .	West Roxbury High School.

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Mary M. Byrne	Lewis School.
Melzar H. Jackson . . .	Mary Hemenway School.
Catherine T. Hunt . . .	Robert G. Shaw School.
Esther M. Larson . . .	Ulysses S. Grant School.

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Frances M. Murphy . . .	Phillips Brooks School.
William R. Kramer . . .	Prescott School.
Bertha C. Quinnam . . .	Roger Wolcott School.
Sidney T. H. Northcott . .	William E. Russell School.

* This pamphlet was prepared by Dennis C. Haley, Roxbury High School, and George W. Gammon, John Marshall School.

PREFACE.

People are beginning to realize, more and more, the need of pure air for healthy living. Many modern homes have sun parlors or sleeping porches. Perhaps we have friends who continually sleep in the open air. In our own city open-air classes have proved to be a decided success. New laws are being enacted to provide an adequate air supply in buildings, to safeguard the public health.

Air, although you may not think of it as such, is a real substance, just as water is. It has weight, occupies space, and exerts pressure on all bodies immersed in it. Air is a mixture of gases, the most important of which are oxygen, nitrogen, carbon dioxide and water vapor. These gases, when studied separately, show many remarkable properties.

Although air contributes to our well-being in many ways, you will doubtless admit that its most important use is for breathing. Whether asleep or awake we breathe about sixteen times each minute. This air is needed to help carry on the life processes of the body, such as oxidation of food materials and the supplying of heat and energy. The delicate mechanism of the body requires a constant supply of fresh air in order to work properly.

We all know how uncomfortable we feel in a crowded street car or poorly ventilated room. Perhaps we have experienced a feeling of weariness or exhaustion from these conditions. If we teach the proper methods of ventilation, these conditions can be avoided in the homes of our pupils.

PROJECT I. TO PROVE THAT AIR IS A REAL SUBSTANCE.

Problem 1. Does Air Occupy Space?

Home Experiments.

a. On the surface of a jar of water place a cork. Invert a large bottle over the cork and force it down into the water in the jar. Notice the level of the water inside the bottle. Is it higher or lower than outside? Why?

b. Into a deep dish filled with water lower an "empty" bottle, mouth downward. (Be sure to hold the bottle in a vertical position.) Tip the bottle at an angle and see what happens. Why didn't the bottle fill before?

Class Experiment.

Fit a flask with a two-hole stopper. Through one hole of the stopper push a funnel tube. Close the other hole with the finger and pour some water into the funnel tube. What happens? Lift the finger. What happens? Repeat the experiment. When does the water go down the funnel tube? Why? When doesn't it? Why?

Conclusions.

We see from these experiments that water cannot get into the containers until some of the air gets out. Hence air occupies space.

Problem 2. Does Air Have Weight?

Class Experiment.

Exhaust the air from a football. Remove the rubber bladder. Flatten it out so that it will contain as little air as possible. Suspend this bladder from one end of a balance, and counterbalance it with sand. Be careful to see that it just balances. While a pupil holds the balance arm, remove the bladder. Take care not to

spill any sand. Inflate this bladder until it is very firm. Put it back on the balance now and see if there is any difference in weight. Which side is heavier? Why?

Conclusions.

Air occupies space and has weight.

PROJECT II. THE USES OF THE GASES IN THE AIR.

Problem 1. Of What Use is the Oxygen of the Air?

Class Experiment.

Into a large test tube put about a teaspoonful of powdered potassium chlorate and an equal amount of manganese dioxide. Bend a piece of glass tubing at right angles. Push one end through a one-hole stopper and fit it into the test tube. Place the test tube in a clamp and attach the clamp to a ring stand. The test tube should be in a horizontal position. Slip one end of a piece of rubber tubing over the open end of the glass tubing. Place the other end of the rubber tubing under the surface of the water in a pneumatic trough. Fill five bottles with water and invert them in the pneumatic trough. Place one of these bottles over the end of the rubber tubing. Heat the mixture in the tube slowly, and collect five bottles of the gas. Before removing the jars of oxygen from the trough, place glass plates over the mouths of the bottles to prevent the oxygen from escaping.

a. Observe the first bottle of oxygen. What color is the gas? Smell the gas. What odor has oxygen?

b. Into one of the bottles place a glowing splint. Note what happens. Remove it and do it again. Make sure the splint is only glowing. Do it as many times as possible. Count them.

c. Wind a piece of wire around a piece of charcoal. Hold it in the Bunsen flame until it is aglow and then lower it into a third bottle of the pure oxygen. Describe what happens. What gas is formed?

d. Place some sulphur in a combustion cup and light it. Observe the size and luminosity of the flame. Remove the cover from a fourth bottle of pure oxygen and lower into it the burning sulphur. How is it different? What gas is formed?

e. Barely cover the bottom of the fifth bottle of oxygen with water. Hold one hand over the mouth of the bottle to prevent the oxygen from escaping. Take a piece of ordinary picture cord wire and unravel it for about an inch. You will then have at the tip several small threads of iron. Dip it into some powdered sulphur, light it, and quickly transfer it into the bottle of pure oxygen. (The sulphur is simply an aid to heat the iron wire to its kindling temperature.) Describe what you see. What substance is formed when iron burns? State all the properties of oxygen that you have observed from this experiment. Of what use is the oxygen of the air? What do you mean by burning?

Conclusions.

Oxygen is a colorless, odorless and tasteless gas. It is an excellent supporter of combustion and is the part of the air that causes things to burn. When charcoal, sulphur and iron burn in oxygen, carbon dioxide, sulphur dioxide and iron oxide are formed. Burning is the rapid union of a substance with oxygen.

PROBLEM 2. WHAT PART OF THE AIR IS OXYGEN?

Class Experiment.

Place a small piece of yellow phosphorus in a small tin cover. Put the tin cover containing the phosphorus in the cover of an ordinary quart Mason jar. Fit a new rubber ring to the jar. Invert the jar and screw it down firmly into the cover. Make sure the cover is on tight. Keep the jar in this inverted position, and hold it in a dish of hot water. What happens to the phosphorus? Where did it get the heat? Why was it better to place the phosphorus in a small tin cover and not on a block of wood? After the phosphorus stops burning cool the

contents of the jar by running cold water over it for five minutes; then remove the cover from the jar, holding the mouth of the jar under the surface of some water. What happens? Name the part of the air that has been used up. Now put the cover back on the jar. Remove the jar from the dish of water and stand it upright on the table. Take off the cover and lower into the jar a blazing splint. How is the substance in the jar different from ordinary air? It consists largely of one gas. Name it. Describe its properties, that is, color, taste, odor, etc. Is it of any use in the air? To answer this, think of what happened to the iron wire when heated and put into a bottle of pure oxygen.

The volume of water in the jar represents the amount of oxygen in the jar before burning the phosphorus. Measure it in cubic centimeters. Measure the contents of the jar. Calculate the percentage of oxygen, the active part of the air. The remainder is inactive and is largely nitrogen. About what percentage of air is inactive?

Conclusions.

The heat of the hot water raises the phosphorus to its kindling temperature and it burns. In burning it combines with the oxygen, or the active part of the air. When the cover is removed the water rises in the jar to take the place of the oxygen. The water rises about one fifth of the way, showing that about one fifth of the air is oxygen. About four fifths of the air is the inactive part. The larger portion of this remaining gas is nitrogen. This gas serves to dilute the oxygen of the air, and to diminish its intensity.

Problem 3. What Are the Properties of Carbon Dioxide?

Class Experiment.

Place a handful of marble chips into a bottle or flask. Fit into it a two-hole stopper containing a funnel tube and glass tubing bent at right angles. Connect one end of the glass tubing with a rubber de-

livery tube. Let this extend over into a trough of water containing four bottles filled with water and inverted, ready for the collection of gas. Add dilute hydrochloric acid slowly through the funnel tube until a brisk evolution of gas begins. Collect four bottles of gas by displacement of water.

a. Examine the first bottle, noting the color and odor of the gas. Thrust a blazing splint into the gas.

b. Into the second bottle pour a little water. Cover the mouth of the bottle with the palm of the hand and shake vigorously. Drop a piece of blue litmus paper into the solution. Is this solution water? What has happened to the gas? What is soda water?

c. Put a candle in a tumbler. Light the candle. Pour carbon dioxide from a bottle containing the gas down into the tumbler. What happens and why?

d. Into the fourth bottle of carbon dioxide pour an inch of limewater. Shake for a minute and examine. This is a conclusive test for carbon dioxide. How would you prove that there is carbon dioxide in the breath you are exhaling? Try it. How does carbon dioxide get into the air?

Conclusions.

Carbon dioxide is a heavy, colorless, odorless gas which does not support combustion. It dissolves in water to form carbonic acid, commonly called soda water. It turns limewater milky. This is the test for carbon dioxide gas. Carbon dioxide gets into the air from the breathing of animals, from combustion and from fermentation.

PROJECT III. TO SHOW HOW BREATHING IS NECESSARY FOR LIFE.

Problem 1. How Does the Air We Exhale Differ from That Which We Inhale?

Home Experiment.

Take a small mirror and place it close to the mouth. Breathe on it three or four times. What do you notice? What does it show you about the air we exhale?

Take an ordinary thermometer. Note the temperature. Breathe on the bulb. Explain what happens and why.

Class Experiment.

a. Lower a burning candle into a bottle. In a few minutes remove the candle. Add limewater and shake. What gas was produced in the bottle? Where did it come from?

b. Collect a bottle of gas from the lungs by displacement of water. Add limewater and shake. Compare this gas with the gas from the burning candle. What was the source of the carbon dioxide in this case?

c. Collect a third bottle of gas from the lungs. Stand it upright on the table with a glass plate on it as a cover. Place beside it another bottle full of pure air. Be sure that both bottles are of the same size. Lower into each a burning candle. Which candle burns the longer?

Considering your home and class experiments, state all the ways in which the air we exhale differs from that which we inhale.

Conclusions.

When a person breathes some of the oxygen is used up. Carbon dioxide and water vapor are formed in the body. The air a person exhales contains less oxygen, more carbon dioxide and more water vapor than the air he inhales.

Problem 2. How Much Fresh Air Does Each Person Need an Hour?

Class Experiment.

Fill a liter graduate with water and invert it in a dish of water. Extend a rubber tube in under the mouth of the graduate. Put the other end of the tube in your mouth, and exhale naturally. Note what happens.

Refill the graduate and repeat the experiment. Estimate the average number of cubic centimeters you inhale and exhale in one breath. Change the cubic

centimeters to cubic inches. (One cubic centimeter equals .061 cubic inches; 500 cubic centimeters is 500 times .061, or 30.5 cubic inches; 1,000 cubic centimeters, or one liter, is 1,000 times .061, or 61 cubic inches.) Count the number of breaths you take in a minute. Use the average of five members of your class for the answer. Calculate the number of cubic inches inhaled and exhaled in a minute; in an hour. (A quart jar can be used for this experiment. One quart equals about 58 cubic inches.) Record your results as follows (the results given are practical and about the average):

Number of cubic centimeters of air inhaled and exhaled in one breath	492
Number of cubic inches of air inhaled and exhaled in one breath	30
Number of times you breathe in one minute	17
Number of cubic inches of air inhaled and exhaled in one minute	510
Number of cubic inches of air inhaled and exhaled in one hour	30,600
Volume of carbon dioxide in this exhaled air	1,224 cubic inches, or $\frac{7}{10}$ of a cubic foot.
Amount of fresh air needed to render this amount of exhaled carbon dioxide harmless	2,333 cubic feet.

As exhaled breath usually contains about 4 per cent by volume of carbon dioxide, the volume of carbon dioxide contained in 30,600 cubic inches of exhaled breath is found by taking 4 per cent of the total amount of gas exhaled.

The amount of fresh air needed to render this amount of exhaled carbon dioxide harmless can be found in the following way:

We are told that when there are more than three parts of carbon dioxide derived from the breath in 10,000 parts of air, there is evidence (not from an excess of

carbon dioxide, however) of organic contamination and the air is unfit to breathe. If three parts are permissible in 10,000 parts of air, or 3 cubic feet in 10,000 cubic feet of air then if we exhale just 3 cubic feet of carbon dioxide each hour, we would need just 10,000 cubic feet of fresh air to render this amount of carbon dioxide harmless. If we exhale 1 cubic foot of carbon dioxide each hour we would need one third of 10,000 cubic feet, or 3,333 cubic feet of fresh air. But we only exhale seven tenths of a cubic foot of carbon dioxide each hour, so we will need only seven tenths of 3,333 cubic feet, or 2,333 cubic feet of fresh air each hour.

Conclusions.

It is evident from this experiment that each person should have about 2,000 cubic feet of fresh air an hour. In modern school buildings it is common practice to provide 1,800 cubic feet of fresh air per person each hour.

Problem 3. What Is the Air Capacity of the Lungs?

Class Experiment.

Fill a large bottle or graduate with water. Invert in a basin of water. Inhale as deeply as you can, then, through a rubber tube extending in under the mouth of the inverted bottle, exhale as completely as you can. Measure the amount of breath exhaled. Change the cubic centimeters to cubic inches. (One cubic centimeter equals .061 cubic inches, or 1 gallon equals 231 cubic inches.)

Conclusions.

We seldom exhale and inhale to our total capacity.

The air we inhale and exhale with each breath is called tidal air.

The air remaining in our lungs when breathing normally is called reserve air.

The reserve air is kept pure by being mixed at each breath with the tidal air.

Problem 4. What Are the Functions of the Breathing Organs?

Class Exercise.

A large diagram taken from any physiology text can be drawn on the board by a pupil.

Different colored chalk can be used to show the mouth, nose, windpipe, lungs and air sacs. A good diagram with appropriate questions makes this an interesting and profitable exercise.

It seems an opportune time now to explain how the oxygen is picked up by the red corpuscles and taken around the body to be given off to the cells. The carbon dioxide formed there is brought back to the lungs and finally exhaled.

This explanation is essential to clinch the project, "To show how breathing is necessary for life."

PROJECT IV. THE VENTILATION OF THE SCHOOL AND THE HOME.

Problem 1. What Makes the Air in a Room Move or Circulate?

Home Experiment.

Hold a smoking splint a few inches above a hot coal stove or lighted gas range. What happens to the smoke? What must be happening to the air there? What makes it do this?

Class Experiment.

To help the pupils see why the air is rising over a hot coal range or lighted gas burner, the following demonstration can be done:

Place two large open flasks, equal in size, on ordinary trip scales or balance. Balance them evenly and wait until the indicator is directly on the middle line. If one flask is lighter than the other put a little sand into it until it just balances. Move the flame of a Bunsen burner over the outside of one flask quickly and evenly.

What happens? Which side is heavier? Which lighter? Compare hot and cold air as to weight. Why does the air over a hot stove rise?

Conclusions.

This experiment with the flask shows us that hot air is lighter than cold air.

The air over the stove or gas range was made lighter by being heated. It therefore was forced upward by colder, heavier air coming in underneath. Changing the temperature of the air in different parts of a room changes its weight and thus causes the air to move or circulate.

Problem 2. How Can the Air in a Room Be Kept Pure?

Class Experiments.

The apparatus for this experiment may be made by the teacher or a group of pupils working under his direction outside of recitation time.

Directions.— Take an ordinary wooden box about a foot long and nine inches deep. Stand it up on the side with the open part facing you. On the right side near the top, in a row, bore four holes about three quarters of an inch in diameter and about half an inch apart. Do the same on the left side, but have the holes in a row near the bottom of the box. Block these eight holes with cork stoppers. Have a piece of window glass cut to fit into the front of the box. By means of small nails at the bottom of the box, a little track can be made on which the window glass can be slid in and out conveniently. Remove the glass door by sliding it out, and set five candles about an inch apart in a row in the center of the box.

This apparatus is now ready for demonstration to show how the air in a room can be kept pure. Let the five candles represent five persons in a room. Let the eight holes represent windows.

a. Close all the windows, light the five candles, and slip the glass plate in place. Watch the candles. What happens? This represents a room with no ventilation.

b. Remove the glass plate. Turn the box over to make sure all the bad air escapes. Open the windows at the bottom. Relight the candles and slide the glass door in place. Do the candles continue to burn? This represents a room with windows open only at the bottom. Is it satisfactory?

c. Make sure the box is free from impure air and repeat, closing the windows at the bottom and opening them at the top. This represents a room with windows open at the top. Is it satisfactory?

d. Open the windows both at the bottom and the top. Do the candles burn? From your previous experiments explain why this is the proper method of ventilation. Verify your explanation by holding a smoking splint near the open holes or windows at the bottom of the box and also near the open holes at the top. Through which holes does air enter? From which holes does it escape?

Conclusions.

We see from these experiments that the best way to ventilate a room is to open a window at the top and at the bottom. This allows fresh, cool air to be admitted at the bottom and impure warm air to pass out at the top.

INDIVIDUAL PROJECTS.

1. Write a complete report on how you ventilate your home.

2. Study the ventilating system of your school.

3. Find out the ideal temperature of indoor air. Determine some factors and conditions under which the ideal temperature should be high. Under which it should be lower.

4. Inquire from your folks what means they use to keep the proper amount of moisture in the air. State some of the evil effects of dry air.

SPECIAL APPARATUS.

Football bladder. Gallon bottle.
Ventilation box.

REFERENCES.

Civic Science in the Home. Hunter Whitman. American Book Company.
First Course in General Science. Barber. Henry Holt & Co.
General Science. Lake. Silver, Burdett & Co.
The Science of Everyday Life. Van Buskirk and Smith. Houghton Mifflin Company.
The First Year of Science. Hessler. Benj. H. Sanborn & Co.

SCHOOL DOCUMENT NO. 6—1922

BOSTON PUBLIC SCHOOLS

GENERAL SCIENCE FOR INTERMEDIATE CLASSES

PAMPHLET No. 9— A STUDY OF THE WEATHER

BOSTON
PRINTING DEPARTMENT
1922

In School Committee, Boston, June 5, 1922.

Ordered, That the two accompanying pamphlets of a series of courses in science for intermediate schools and classes,

No. 8. A Study of Air and Ventilation,
No. 9. A Study of the Weather,

are hereby authorized to be printed as school documents.

Attest:

THORNTON D. APOLLONIO,
Secretary.

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GENERAL SCIENCE FOR INTERMEDIATE CLASSES.*

This outline of work has been prepared by a council, comprising teachers in the high, intermediate and elementary schools of the city, under the supervision of Mr. Arthur L. Gould, Assistant Superintendent. The members of the council are as follows:

Joseph R. Lunt, *Chairman* .	English High School.
George W. Gammon, *Secretary*,	John Marshall School.

Representing the high schools:

Charles H. Stone, Jr. . .	English High School.
Ralph C. Bean	Girls' High School.
Francis E. Mason . . .	High School of Commerce.
Adelbert H. Morrison . .	Mechanic Arts High School.
Dennis C. Haley	Roxbury High School.
Lillian J. MacRae . . .	South Boston High School.
Thomas P. Dooley . . .	West Roxbury High School.

Representing the intermediate schools:

Gertrude V. Nugent . .	Emerson School.
Joel W. Reynolds . . .	George Putnam School.
Etta A. Manning . . .	John Winthrop School.
Mary M. Byrne	Lewis School.
Melzar H. Jackson . . .	Mary Hemenway School.
Catherine T. Hunt . . .	Robert G. Shaw School.
Esther M. Larson . . .	Ulysses S. Grant School.

Representing the elementary schools:

Mabel A. Woodward . .	Christopher Gibson School.
S. Albert Cragin . . .	Dearborn School.
Charles H. Early . . .	Henry Grew School.
Frederic H. Buck . . .	Mather School.
Frances M. Murphy . .	Phillips Brooks School.
William R. Kramer . . .	Prescott School.
Bertha C. Quinnam . . .	Roger Wolcott School.
Sidney T. H. Northcott .	William E. Russell School.

* This pamphlet was prepared by Dennis C. Haley, Roxbury High School, and George W. Gammon, John Marshall School.

PREFACE.

The weather, or condition of the atmosphere, controls to a large extent the life of our community and the welfare of many of its people. It determines where certain crops can be grown and where certain animals can be raised. It so affects our enjoyment, health or business that each morning when we arise we look to see the condition of the weather. We wonder if it is clear or cloudy, warm or cold, wet or dry.

In ancient times, history tells us that people studied the weather and kept certain records of it. Later we read of Galileo making an instrument to show differences of temperature. We know that soon afterward, his pupil, Torricelli, made an instrument to measure the pressure of the air.

At the present time almost every home has a thermometer. We see barometers in our schools. Almost every public building or institution has a weather vane on its tower. These are three important instruments that we use in our study of the weather.

Advanced information about the weather is of such importance to commerce and industry that our government maintains a Weather Bureau at Washington. There are many branch weather stations throughout the United States, where daily observations are taken. As a result we have a daily weather map printed, and warnings of storms or frosts issued from twelve to twenty hours in advance. These save many lives and thousands of dollars.

Of the many things we study about weather, perhaps the most wonderful, and valuable, is rain. If it were not for rainfall, our rivers and streams would dry up, our lands would become barren, and our mode of living would be entirely changed. Nature has provided a means for taking water into the air and also for condensing it back again in the form of rain, dew or snow. These changes go on almost unknown to us, and maintain conditions indispensable to life and comfort.

PROJECT I. THE USE OF WEATHER INSTRUMENTS.

Problem 1. What Are the Characteristics of a Thermometer?

Home Experiment.

Look up the derivation of the word "thermometer." Find out who made the first thermometer. What did the bulb of his thermometer contain? Examine the thermometer you have at home. What is it made of? What substance does the bulb contain? Why not use water in the bulb? The little opening running up through the glass stem is called the bore. What is true of its size? What is the highest figure on the scale? What is the lowest? What other markings do you find on this scale? Pupils who have no thermometer at home can obtain this information by examining the room thermometer.

Class Experiment.

Let the class examine an ordinary Fahrenheit thermometer. Examine a Centigrade thermometer. State all the ways in which they are exactly alike. State all the ways in which they are unlike. Draw a diagram of each. Put in the different markings. Be sure the point marked "Freezing point of water" on the Fahrenheit thermometer is opposite the same point on the Centigrade thermometer.

Conclusions.

The answers to the foregoing questions, together with the diagram showing the differences between the two thermometers, are the conclusions of this experiment.

Problem 2. What Causes the Mercury to Rise and Fall, or to Indicate Temperature?

Class Experiment.

Put the bulb of a thermometer into a basin of warm water. What happens? Put it into some cold water.

What happens? Can you explain why it acts this way? The following experiment shows why:

Fill an Erlenmeyer flask with water. Color it with a little red ink. Press firmly into the mouth of the flask a one-hole stopper, containing a piece of glass tubing about 6 inches long. Heat the water in the flask for a few minutes. What happens? Why? Allow the water to cool. What happens? Why? Now explain why the mercury rises and falls in a thermometer. What is the advantage of having the bore so small?

Conclusions.

When the mercury in a thermometer is warmed, it expands and rises. When the mercury cools it contracts and falls. The glass also expands and increases the capacity of the bulb; but it only expands one seventh as much as the mercury. If the bore is small, the expansion or contraction of the mercury is more easily noticed, making it easier to detect a slight change in temperature.

Problem 3. How Is a Thermometer Marked Off Into Degrees?

Class Experiment.

Fill a beaker with finely broken ice or snow. Lower into it the bulb of an ungraduated thermometer. Notice where the mercury comes to rest. Mark this point with a pencil. This is called the freezing point. Remove the thermometer and suspend it in a flask partly filled with water. Boil the water and allow the thermometer to remain in the steam until the mercury comes to rest. Mark this point with a pencil. This is called the boiling point. If we wish to make it a Centigrade thermometer, we call the freezing point zero, and the boiling point 100 degrees. Where would the 50-degree mark be? The 75 and 25-degree marks? Draw a diagram on the board, and show how the individual degree marks are obtained. From this scale it should be evident why it is called a Centigrade thermometer.

To make a Fahrenheit thermometer, call the freezing point 32 degrees, and the boiling point 212 degrees. Show by a diagram on the board how the individual degree marks of this thermometer are obtained.

Conclusions.

The freezing point of water and its boiling point (under standard conditions) determine the fixed points of a thermometer. The space between these two fixed points is divided into 100 equal parts for the Centigrade thermometer and into 180 equal parts for the Fahrenheit scale.

PROBLEM 4. HOW IS A MERCURIAL BAROMETER MADE?

Review the project, "To prove that air is a real substance." (See pamphlet 8.)

Home Experiment.

Fill a glass brimming full of water. Cover it with a piece of tissue paper or cardboard. See if you can hold the glass in a horizontal position without spilling the water. See if you can invert the glass without the water running out. What presses against the paper and holds the water back? Does air exert pressure?

Class Experiment.

Make a barometer as follows: Take a thick piece of glass tubing about three feet long and closed at one end. Fill the tube with mercury. Hold the thumb over the open end and invert into a cup of mercury. Remove the thumb only after the lower end of the tube is below the level of the mercury in the cup. How high does the mercury stand in the tube? What holds the mercury up? If a liquid were one half as heavy as mercury, how high would it stand? Water is about one thirteenth as heavy as mercury. About how high will the atmosphere hold a column of water? Why isn't water used in a barometer? What effect does elevation have on the height of the column of mercury? If for any reason

the air becomes lighter, what happens to the column of mercury? If the air becomes heavier what happens?

Conclusions.

This problem makes it possible to understand the making of the mercurial barometer. The home experiment shows that air exerts pressure upon all bodies immersed in it. This idea, carried over to the barometer, shows that the column of mercury is held up by the pressure of the atmosphere on the surface of the mercury in the cup. The column of mercury just balances a column of air as high as the atmosphere extends.

If the air becomes lighter the pressure decreases, and it will not support so high a column of mercury. If the air becomes heavier the pressure increases and supports a higher column of mercury. Hence the height of the mercury column shows the weight or pressure of the air.

Problem 5. What Are the Characteristics of an Aneroid Barometer?

Class Experiment.

If an aneroid barometer is available it should be studied.

Look up the meaning of "aneroid." Describe the aneroid barometer. What is the purpose of the figures? Of the pointer? Note the position of the pointer. Examine it tomorrow and see if it is in the same place. See if you can find out how an aneroid barometer is constructed. Explain how it can tell the pressure of the air. What advantages has it over a mercurial barometer?

The class should be given board practice in reading both the aneroid barometer and the mercurial barometer, to determine the pressure of the air.

Conclusions.

The aneroid barometer consists essentially of a metal box which has a thin corrugated metal top. The air is

pumped out of the box and the box is sealed. The top is supported by a stout spring which prevents it from collapsing. When the pressure of the air increases this top moves down a little. When the pressure of the air is lighter the top moves up a little. This small motion is greatly magnified by small levers and a chain, and is communicated to the pointer, which moves over a scale. The scale is graduated, to correspond to the readings of a mercurial barometer.

Aneroid barometers are made in many sizes, even as small as watches. This makes them very convenient to carry.

Problem 6. How Does A Weather Vane Work?

On your way to school try to locate a weather vane. Be able to describe it. See if you can tell from it the direction of the wind.

Class Experiment.

By means of a compass determine north, east, south, and west. Use two yardsticks or chalk lines to show these directions. Make a small weather vane and set it up over these lines. Stand to the north of this small vane and blow on it. In what direction does the arrow point? Why does the arrow take this position? Continue to blow on the vane and gradually move toward the east. What is the position of the arrow as you move? Repeat the experiment in a similar way to show the position of the vane when there is a south or a west wind. Now explain how you can determine the direction of the wind from the weather vane you located on your way to school.

PROJECT II. TO KEEP A RECORD OF THE WEATHER FOR A MONTH.

Keep a daily record of the weather in your notebook.

Put the following table on the blackboard and let different members of the class fill in the data. The recording of these data should be done at about the same time each day.

Date.	Hour.	Temperature.	Barometer Reading.	Direction of Wind.	Velocity of Wind.	Kind of Day.

Explanation of Table.

In the column "Velocity of Wind" the words *light*, *moderate* and *high* may be used. If the leaves on the trees are just moving, we may say the wind is light. If small branches are moving, it is moderate. If large branches are swaying, then it is high. In the column "Kind of Day," the symbols used on the weather map may be used.

PROJECT III. TO UNDERSTAND THE WEATHER MAP.

Class Experiment.

Each pupil should be given a weather map for study. Where is this map printed? By whom? What two different kinds of lines do you notice on the map? What do the continuous lines represent? Follow one from beginning to end. Notice the figures at each end? What do these figures mean? Notice the dotted lines. What are these lines? Follow one of them. Is it labeled the same at both ends? What do the arrows show? What do the circles mean? What was the condition of the weather in your city when this map was printed?

Examine an area marked "Low." What is the lowest pressure there? As you move from the center of this low area, how does the pressure change? Notice the arrows. Does the wind blow toward the center of this area or away from it?

Examine an area marked "High." Note the highest pressure. As you move from this center, does the pressure increase or decrease? Does the wind blow toward the center of this area or away from it?

PROJECT IV. TO SHOW THE PROGRESS OF A STORM ACROSS THE UNITED STATES.

Class Experiment.

Locate a low area on a weather map. Examine the map of the following day and note the new position of this low area. By means of the scale of miles determine how far it traveled. In what direction is it traveling? How long will it take to reach you if it travels at the same speed? How long would it take a "low" to travel across the continent if it traveled at this rate? Of what use are these weather maps? Watch the map each day and see if you can forecast the weather. Compare the weather maps of the same days with the record of weather that you have been keeping in your class room. How do they agree?

PROJECT V. A STUDY OF THE RAIN CYCLE.

Problem 1. How Does Water Vapor Get into the Air?

Class Experiments.

(*a*) Pour a little water into a shallow dish and set it in the sun or on a radiator. Examine it the following day. Is the quantity the same? Where did the water that disappeared go? What is this process called? What do you consider the greatest source of water vapor in the air?

(*b*) Fill a flat dish with black earth. Moisten it with water. Set it aside and examine the following day. State a second source of water vapor in the air.

(*c*) Fill an ordinary drinking glass three quarters full of water. Cover it with a cardboard containing a small hole. Force the stem of a geranium plant through the hole until it projects down into the water. Cover the plant with another glass. Make sure the glass covering the plant is dry. Set the apparatus in the sun. What do you notice on the inside of the glass? How did it get there? State a third source of water vapor in the air.

Conclusions.

Water vapor gets into the air by a process called evaporation. During this process water changes from a liquid into an invisible gas. The oceans, lakes and rivers are the greatest source of water vapor. The air is constantly evaporating water from the soil or the surface of the earth. Plants absorb a great deal of water from the soil, together with the mineral food they need. More water flows up through the plant than is needed for the manufacture of its food. This surplus water is given off into the air through openings in the leaves.

PROBLEM 2. WHAT CONDITIONS AID EVAPORATION?

Class Experiments.

(*a*) With a Bunsen burner heat a small portion of the blackboard. Moisten a cloth and wet this portion of the board. Wet an equal portion of the board which has not been heated. Which portion dries the more quickly? Draw a conclusion regarding the effect of temperature on the rate of evaporation.

(*b*) Put a little water into a cup. Put an equal amount into a large flat dish. Place the two side by side to be examined the next day. The temperature in this case is the same for both. The following day meas-

ure the amount of water that is left in each. Why did the water in the dish evaporate faster than the water in the cup?

(*c*) Moisten a cloth and wet two portions of the blackboard. Fan one of these wet spots. Which dries faster? Explain.

(*d*) Put a little water into each of two saucers. Cover one with a bowl. The bowl should rest on a cardboard or blotter. Set them away and examine the next morning. The temperature and surface of the liquid exposed to the air are the same for both. Which saucer has the more water in it? Why did the water evaporate so much slower in one case than in the other?

Briefly summarize all the conditions that aid evaporation. That hinder evaporation. Why do clothes dry faster on sunny days? On windy days? On dry days?

Conclusions.

From "a" we see that a high temperature increases evaporation. From "b" we see that the larger the exposed surface the more rapid is the evaporation. From "c" we see that the rate of evaporation depends upon the rate of renewal of fresh air. From "d" we see that evaporation of water is retarded by moisture in the air. Hence dry air is favorable for evaporation.

Clothes dry best on a day when the air is dry, when the sun is hot, when there is a good wind blowing, and when the clothes are shaken out and hung on lines so as to expose a large surface to the air.

Problem 3. What Effect Has Evaporation on the Temperature?

Home Experiment.

Wet your finger in a basin of water. Blow on it. How does it feel? What causes this sensation of cold?

Class Experiments.

(*a*) Pour a few drops of gasolene or alcohol on the palm of your hand. What happens to the liquid?

Where does it get the necessary heat? What sensation do you notice? Is it greater or less than in the case where water was used?

(*b*) Wrap a small piece of cotton cloth around the bulb of a thermometer and tie it on with a thread. Pour enough alcohol or gasolene on the cloth to saturate it. Fan the cloth. Watch the thermometer. What change do you notice in the temperature? Explain.

Conclusions.

The evaporation of water on the finger requires heat. It takes heat from the finger, and we feel the sensation of cold. The same is true of the gasolene and alcohol; but since they evaporate more rapidly than water, the sensation of cold is stronger.

The evaporation of alcohol or gasolene from the cloth around the bulb of the thermometer cools the mercury and it drops.

PROBLEM 4. HOW DOES A HYGROMETER MEASURE THE RELATIVE HUMIDITY OF THE AIR?

Class Experiment.

By *relative humidity* we mean the degree of saturation, or the ratio between the amount of moisture actually present in a given volume of air, and the amount which would be present if the air were saturated.

A hygrometer can be made as follows: First make a frame by nailing two boards together at right angles. Hang two thermometers side by side on the upright board. Wrap a small piece of muslin tightly around the bulb of one thermometer, and tie it in place with a thread. Soak the cloth with water and allow the end of it to dip down into a beaker of water placed under the thermometer. The apparatus is now ready for use.

The wick here serves the same purpose as the wick of a lamp. What is it? If the air in a room is saturated with water vapor, what effect will this have on the rate

at which water will evaporate from the wick? If there is no evaporation of water from the wick, what effect will this have on the temperature? Then if there is practically no difference between the two thermometer readings, what will be the condition of the air? If air is not saturated, what effect will this have on the rate at which water will evaporate from the wick? How will the evaporation of water around the wet bulb affect this thermometer? Then, if there is a great difference between the wet and the dry bulb thermometers, what will the condition of the air be? *Now fan the wet bulb thermometer.* What do you notice? Continue until the mercury ceases to fall. Record the wet and the dry thermometer readings. Consult the table for finding the relative humidity.

Temperature of the air (as shown by dry bulb thermometer) . —— ° F.
Reading of the wet bulb thermometer . . . . . —— ° F.
Difference, due to evaporation . . . . . —— ° F.
Relative humidity (as shown by table) . . . . . —— %

Conclusions.

If the air in the room is saturated with water vapor there will be no evaporation from the wick surrounding the wet bulb thermometer, and the two thermometers will read the same. If the air is not saturated, evaporation of water from the wet bulb will take place. This evaporation will be accompanied by a lowering of temperature and hence the wet bulb thermometer will read lower than the dry one. The lower the relative humidity the more rapid the evaporation and hence the greater the difference between the readings of the two thermometers. The higher the relative humidity, the less rapid the evaporation and hence the less the difference between the readings of the two thermometers. For the most healthful and comfortable conditions the relative humidity should be from 50 to 65 per cent.

Why are we uncomfortable on "dog days" in summer? Is the relative humidity of your class room too high or too low? How does this affect the health of your pupils?

RELATIVE HUMIDITY TABLE.

DIFFERENCE IN DEGREES BETWEEN WET AND DRY BULB THERMOMETERS.

Reading of Dry Bulb Thermometer.	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0
45	93	86	79	71	65	58	52	45	39	33	26	20	14	8	2		
46	93	86	79	72	65	59	53	46	40	34	28	22	16	10	4		
47	93	86	79	73	66	60	54	47	41	35	29	23	17	12	6	1	
48	93	87	80	73	67	60	54	48	42	36	31	25	19	14	8	3	
49	93	87	80	74	67	61	55	49	43	37	32	26	21	15	10	5	
50	93	87	81	74	68	62	56	50	44	39	33	28	22	17	12	7	2
51	94	87	81	75	69	63	57	51	45	40	35	29	24	19	14	9	4
52	94	88	81	75	69	63	58	52	46	41	36	30	25	20	15	10	6
53	94	88	82	75	70	64	58	53	47	42	37	32	27	22	17	12	7
54	94	88	82	76	70	65	59	54	48	43	38	33	28	23	18	14	9
55	94	88	82	76	71	65	60	55	49	44	39	34	29	25	20	15	11
56	94	88	82	77	71	66	61	55	50	45	40	35	31	26	21	17	12
57	94	88	83	77	72	66	61	56	51	46	41	36	32	27	23	18	14
58	94	88	83	77	72	67	62	57	52	47	42	38	33	28	24	20	15
59	94	89	83	78	73	68	63	58	53	48	43	39	34	30	25	21	17
60	94	89	84	78	73	68	63	58	53	49	44	40	35	31	27	22	18
61	94	89	84	79	74	68	64	59	54	50	45	40	36	32	28	24	20
62	94	89	84	79	74	69	64	60	55	50	46	41	37	33	29	25	21
63	95	90	84	79	74	70	65	60	56	51	47	42	38	34	30	26	22
64	95	90	85	79	75	70	66	61	56	52	48	43	39	35	31	27	23
65	95	90	85	80	75	70	66	62	57	53	48	44	40	36	32	28	25
66	95	90	85	80	76	71	66	62	58	53	49	45	41	37	33	29	26
67	95	90	85	80	76	71	67	62	58	54	50	46	42	38	34	30	27
68	95	90	85	81	76	72	67	63	59	55	51	47	43	39	35	31	28
69	95	90	86	81	77	72	68	64	59	55	51	47	44	40	36	32	29
70	95	90	86	81	77	72	68	64	60	56	52	48	44	40	37	33	30
71	95	90	86	82	77	73	69	64	60	56	53	49	45	41	38	34	31
72	95	91	86	82	78	73	69	65	61	57	53	49	46	42	39	35	32
73	95	91	86	82	78	73	69	65	61	58	54	50	46	43	40	36	33
74	95	91	86	82	78	74	70	66	62	58	54	51	47	44	40	37	34
75	96	91	87	82	78	74	70	66	63	59	55	51	48	44	41	38	34
76	96	91	87	83	78	74	70	67	63	59	55	52	48	45	42	38	35
77	96	91	87	83	79	75	71	67	63	60	56	52	49	46	42	39	36
78	96	91	87	83	79	75	71	67	64	60	57	53	50	46	43	40	37
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Problem 5. What Causes Dew and Frost?

Home Assignment.

Bring in five examples to show how water condenses on objects.

Class Experiment.

Partly fill a polished metal cup or polished calorimeter with water drawn from the faucet. Put a thermometer into it and stir; add small bits of ice from time to time. What do you notice forming on the polished can? Note the temperature of the ice water. This is also the temperature of the air immediately surrounding the metal can. It is called the dew point. How would you define dew point? Explain how you caused the dew to form? Explain natural dew. If the temperature is below 32 degrees Fahrenheit, what will happen? Find out what conditions favor the formation of dew. What conditions, which fruit growers must be mindful of, favor the formation of frost?

Conclusions.

The temperature at which air begins to deposit moisture is called the dew point. The air surrounding the polished can is cooled, has a smaller capacity for holding water vapor, and finally reaches a temperature at which it begins to deposit some of it. When grass and bodies near the ground radiate their heat they cool the air near them. This air deposits some of its moisture upon these objects. If the temperature is 32 degrees Fahrenheit or lower, frost is formed instead of dew.

Problem 6. What Is the Rain Cycle?

Class Experiment.

Heat a kettle of water until it boils vigorously. What do you notice a few inches from the nozzle? What does it resemble in nature?

Take a cold pan, invert it, and hold it over this cloud. In a short time what do you notice on the bottom of the

inverted pan? Allow this substance to accumulate until it falls. What does it resemble in nature? Compare what you see with what takes place in nature to cause rain.

Conclusions.

Water is evaporated from the ocean, rivers and the ground by the heat of the sun. When this air cools enough, the moisture condenses and clouds are formed. When the particles gather together into drops large enough to fall to the earth, we have rain. This water may again be evaporated and the cycle continues.

SPECIAL APPARATUS.

Ungraduated thermometer.	Mercury well.	Weather vane.
Barometer tubing.	Aneroid barometer.	Polished metal cup.
Mercury (2 pounds).	Weather maps.	

REFERENCES.

The Thermometer and its Family Tree. P. R. Jameson Taylor Instrument Company, Rochester, N. Y.
Weather Series for the Amateur. P. R. Jameson Taylor Instrument Company, Rochester, N. Y.
Science for Beginners. Barber. Henry Holt & Co.
The Wonder Book of The Atmosphere. Houston. Houghton Mifflin Company.
About the Weather. Harrington. Appleton & Co.
General Science. Caldwell and Eikenberry. Ginn & Co.
The Science of Common Things. Tower and Lunt. D. C. Heath & Co.

SCHOOL DOCUMENT NO. 7—1922

BOSTON PUBLIC SCHOOLS

GENERAL SCIENCE FOR INTERMEDIATE CLASSES

PAMPHLET No. 10—FIRE

BOSTON
PRINTING DEPARTMENT
1922

In School Committee, Boston, July 5, 1922.

Ordered, That the three accompanying pamphlets of a series of courses in science for intermediate schools and classes,

No. 10. Fire,
No. 11. Heat,
No. 12. Sound,

are hereby authorized to be printed as school documents.

Attest:

THORNTON D. APOLLONIO,
Secretary.

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GENERAL SCIENCE FOR INTERMEDIATE CLASSES.*

This outline of work has been prepared by a council, comprising teachers in the high, intermediate and elementary schools of the city, under the supervision of Mr. Arthur L. Gould, Assistant Superintendent. The members of the council are as follows:

Joseph R. Lunt, *Chairman*	English High School.
George W. Gammon, *Secretary*,	John Marshall School.

Representing the high schools:

Charles H. Stone, Jr.	English High School.
Ralph C. Bean	Girls' High School.
Francis E. Mason	High School of Commerce.
Adelbert H. Morrison	Mechanic Arts High School.
Dennis C. Haley	Roxbury High School.
Lillian J. MacRae	South Boston High School.
Thomas P. Dooley	West Roxbury High School.

Representing the intermediate schools:

Gertrude V. Nugent	Emerson School.
Joel W. Reynolds	George Putnam School.
Etta A. Manning	John Winthrop School.
Mary M. Byrne	Lewis School.
Melzar H. Jackson	Mary Hemenway School.
Catherine T. Hunt	Robert G. Shaw School.
Esther M. Larson	Ulysses S. Grant School.

Representing the elementary schools:

Mabel A. Woodward	Christopher Gibson School.
S. Albert Cragin	Dearborn School.
Charles H. Early	Henry Grew School.
Frederic H. Buck	Mather School.
Frances M. Murphy	Phillips Brooks School.
William R. Kramer	Prescott School.
Bertha C. Quinnam	Roger Wolcott School.
Sidney T. H. Northcott	William E. Russell School.

* This pamphlet was prepared by Ralph C. Bean, Girls' High School; Joseph R. Lunt, English High School, and Sidney T. H. Northcott, William E. Russell School.

PREFACE.

The progress of mankind, from primitive savagery, has been, in part at least, his progress in the use and control of fire. The full understanding of just what fire is has been grasped only within the last few generations.

The building of fires has a fascination for every boy and girl. They seem to come under the spell of this ancient rite. About this subject a series of experiments can be built up, which not only arouse deep interest but also lead to a practical understanding of the science of combustion. This process of oxidation is so universal, and so fundamental, that it seems to enter into our everyday lives, at almost every turn.

The following experiments are selected with a view to the gradual unfolding of the subject of combustion; to show the substances used, the part played by oxygen, and the methods of control. The experiments have been selected with a view to the use of simple apparatus, so that the pupil's mind may not, needlessly, be distracted by the details of complicated apparatus. We believe that these experiments also afford some training in methods of straight thinking, which is of as much value as the accumulation of facts.

PROJECT I. THE COMMON FUELS.

Secure as much of the following material as you can. Bring it to school for class study.

Pieces of anthracite coal of different sizes.
Pieces of bituminous coal.
Pieces of coke.

Problem 1. A Study of Anthracite Coal.

What is the origin of this coal? Tell briefly how the trees and plants were changed to coal. How is anthracite mined? Where are the mines located? What is the best route of transportation from the mines to your home? What does the color of this coal indicate as to its composition? Can you make a mark with it on paper? Try to scratch a piece of anthracite with a pin. Strike two pieces together. Do they break up easily? How does this coal burn? For what purposes is it used?

Problem 2. How Anthracite Coal is Sold.

How is coal screened? What are the common market sizes into which it is separated? Make a series of outline sketches showing the comparative sizes of pea, nut, stove, egg and furnace. Investigate the current prices and uses of the different sizes of anthracite coal. Arrange your information as follows:

Size.	Cost Per Ton.	Where Used.
Pea		
Nut		
Stove		
Egg		
Furnace		

What sizes cost most? How do you account for this? What are the best sizes to use in the kitchen range? In the furnace? In the steam or hot water heating plant?

Problem 3. A Study of Bituminous Coal.

How does the formation of this coal differ from that of anthracite? Observe the color. What does this indicate as to its composition? Can you make a mark with it on paper? Try to scratch a piece of bituminous with a pin. Strike two pieces together. How does it compare in this respect with anthracite? How does bituminous coal burn? For what purpose is it used? How does the cost per ton compare with the cost of anthracite?

Problem 4. A Study of Coke.

What is the color of coke? Will it make a black mark on paper? How is coke manufactured? What is driven off from soft coal in this process? What are the small holes in coke? How were these holes formed? How does the weight of coke compare with the weight of coal? Tell how coke burns. Will a hod of coke burn as long as a hod of anthracite? Which is easier to kindle? How should dampers be regulated when you burn coke? What is the cost per ton? Do you consider coke an economical fuel?

Problem 5. Burning Coal at Home.

What kind of coal do you burn at home? What sizes do you use in the kitchen range? In the furnace? In the steam or hot water heating plant? Why do you use these sizes? What assurance have you, when you purchase coal, that you receive full weight paid for? Examine a public weigher's certificate. What impurities do you find in your coal? Do you find any unburned coal in the ash barrel? How can you do away with this waste?

Problem 6. A Study of Peat.

Examine pieces of peat. Where is peat found? How is it formed? What is its color? How does it compare with coal in weight and texture? How would it compare as a fuel? Why do we not use it in New England?

PROJECT II. HOW TO KINDLE A FIRE.

Problem 1. How a Match Kindles.

Home Experiment.

Scratch the head of a common match on a rough surface. What begins to burn first? Second? Third? Why do these substances kindle in this order? How did the Indians start a fire? What methods of starting a fire were used in colonial days? Why do you sc atch the head of a match on a rough surface to start it burning?

Problem 2. How to Kindle a Fire in the Coal Range.

Home Experiment.

Kindle a fire in the coal range at home. Use only paper, wood and coal. Never use kerosene for this purpose. Tell how you arrange the materials. Why do you crumple the paper? How do you lay the wood? How large are the sticks of wood that you first put on? In what order do these materials kindle? When do you put the coal on? Why does the paper kindle first? Why does the wood kindle next? Why does the coal kindle last? Why does a small piece of wood kindle quicker than a larger piece?

Secure a broom handle made of hard wood. Saw off a piece, about a foot long. Try to kindle this, by holding a burning match just under the center. With a sharp knife, cut off a shaving of wood from the broom handle. Hold a burning match under this. What happens? How do you account for this? Note.— The broom handle and shaving have the same kindling temperature.

Problem 3. A Study of Kindling Temperatures.

Class Experiment.

Secure a shallow thin cover, about two inches in diameter. The cover of a baking powder can will work to advanatge. Heat about a pint of water until it begins to boil. Fill a glass beaker nearly to the top

with hot water. Float the tin cover on the surface of the water in the beaker. Cut off a piece of yellow phosphorus the size of a pea. Pick it up with forceps and drop it into the cover. Why does the phosphorus kindle so quickly? Wait until the phosphorus burns completely. Clean the tin cover. Now pour out the water from the beaker, and replace it with hot water. Float the tin cover on the surface of the water again. Cut off a piece of sulphur the size of a pea. Drop it into the tin cover. Does it begin to burn? Hold it over the flame of a candle for a few minutes. Why does the sulphur begin to burn now? Thoroughly clean the tin cover. Crumple a piece of tissue paper into a wad. Drop it into the tin cover. Again hold the tin cover over the candle flame for several minutes. Does the paper burn? Hold the tin cover over the flame of a Bunsen burner for several minutes. What happens to the wad of paper? Does it start to burn now? Compare the kindling temperatures of phosphorus, sulphur and paper. Discuss the kindling temperatures of ether, gasolene, kerosene, turpentine, cotton, wool, wood, coal and asbestos.

With a pair of forceps, hold the point of a pin in the flame of a burning candle. Carefully watch the point of the pin. Now hold the point of a large nail in the flame. Can you heat the nail red hot? Why is it possible to heat the point of a pin red hot? Which is hotter, a spoonful of boiling water, or a large kettle full of lukewarm water? Which contains more heat? Distinguish between temperature and quantity of heat? Can you explain now why the wood shaving (Problem 2) kindles easier than the broom handle?

Conclusions.

Phosphorus has the lowest kindling temperature of these substances. For this reason it is used on the heads of matches. The phosphorus in burning produces enough heat to raise the next substance to its kindling point. Finally the wood of the match kindles.

A second consideration in kindling a substance is the amount of material which must be heated. Obviously a thin shaving of wood will be heated to a certain temperature quicker than a large piece. A candle heats a pin red hot, but not a nail, because it takes so much more heat to raise the nail to the same temperature.

Questions.

1. Why is it difficult to kindle a fire with furnace coal?
2. Why does pea coal kindle quicker than stove?
3. Why is it exceedingly dangerous to use ether or gasolene in the kitchen?
4. Why do some people use kerosene to start a fire?
5. Why do you split kindling wood into small pieces?
6. Why does the fire sometimes go out when you add fresh coal?
7. Is it possible to kindle a coal fire using paper and coal?
8. What difficulties have you experienced in kindling a fire?

PROJECT III. WHAT MAKES A FIRE BURN?

Home Experiment.

Open all the dampers in the coal range at home. Shake down the fire until a glow can be seen in the ash pan. Observe the fire from time to time. How does it burn? Hold a smoking paper before the opening of the ash door. How does the shaking help to make the fire burn faster?

Class Experiment.

Place three short paraffin candles close together on a table. Light the candles. Secure two strips of wood half an inch thick and six inches in length. Arrange the wooden strips on opposite sides of the candles. Now lower a tall lamp chimney over the candles and let the base rest on the strips of wood. How do the candles burn? Hold a smoking stick near the opening at the base of the lamp chimney. What does this prove?

Remove the strips of wood and let the base of the lamp chimney rest on the table. Watch the candle flames. How do you account for this? Do the flames of all the candles go out? Why?

Conclusion.

There is evidently air moving into the stove or chimney where the fire is burning. Without air the fire goes out. Hence it is air or the oxygen in air which makes the fire burn.

PROJECT IV. A STUDY OF OXYGEN.

Problem 1. How to Make Oxygen and Test it.

Class Experiments.

(*a.*) Take a large test tube of hard glass. Fit it with a one-hole rubber stopper. Through this hole push a short piece of glass tubing. Over the end of the glass tubing slip one end of a piece of rubber tubing, two feet long. Thoroughly mix a scant teaspoonful of potassium chlorate and a quarter teaspoonful of a black powder (manganese dioxide). Pour this mixture into the test tube and insert the rubber stopper. Attach the test tube to a ring stand by means of a clamp. Now fill two wide-mouthed bottles with water, and invert in a basin of water. Slip the end of the rubber tubing under the mouth of one of the bottles. Heat the test tube evenly with the Bunsen flame. What are the bubbles that you see at first? Fill both bottles. Why does the water go out of the bottles? With what are they filled now? Cover with a glass plate and remove bottles to the table. Light a splint of wood and blow out the flame, so that it continues to glow. Insert the glowing splint into a bottle. Repeat until no result. Insert a *burning* splint in a bottle. Repeat. Does the oxygen burn? What effect does oxygen have on the burning splint? On the glowing splint? What is the most conspicuous property of oxygen?

(*b.*) Put a small piece of sulphur on a deflagrating

spoon. Ignite the sulphur. Thrust this into a bottle of oxygen, prepared as before. How does the sulphur burn in air? How does it burn in oxygen? What is left in the bottle? How does it smell? What is the effect of litmus?

(*c.*) Into a second bottle, filled with oxygen, pour some sand to cover the bottom. Insert a piece of iron picture cord wire, which may be tipped with burning sulphur. How does the iron burn in air? In oxygen? What is produced?

Conclusions.

Oxygen is a colorless gas, and makes things burn, but does not burn itself. In other words it is a supporter of combustion.

When sulphur burns the product is sulphur dioxide, a gas with a choking odor, which with water forms an acid. It is very poisonous, and is used for fumigation.

When iron burns, heat is produced as it always is when oxygen unites with any substance.

QUESTIONS.

1. Explain why a fire burns fast in the coal range when the dampers are open.
2. How does a thick bed of ash on the grates affect the fire?
3. Why does the fire burn better when the ash pan is clean?
4. How does the height of the chimney affect the fire?
5. Why is it difficult to put out a grass fire on a windy day?
6. If the air were all oxygen, how would a fire behave if once started?

PROJECT V. HOW TO CHECK A FIRE.

PROBLEM 1. HOW TO CHECK A FIRE IN THE COAL RANGE.

How do you check a fire for the night in the coal range? Why do you close the ash door slide? Why

do you partly close the check damper? Why do you put cinders on the fire? Explain in detail how you check a fire in the coal range or heater.

Problem 2. How the Dampers Work.

(*a*) Set a quart milk bottle on the table. Fasten a candle to a short piece of wire. Light the candle and lower it into the bottle. Place a tin cover over the mouth of the bottle. Watch the flame of the candle. How long does it burn? Why does it go out? Why do you close the ash door slide to check the fire?

(*b*) Place three burning candles close together on the table. Lower a lamp chimney over the candles and let the base rest on two narrow strips of wood. How do the candles burn? Now hold a tin cover tightly over the top of the lamp chimney. What happens? How do you account for this? Why do you partly close the check damper in the coal range?

Conclusion.

Fire is checked by reducing the supply of available oxygen, and also by preventing the burned gases from escaping.

Questions.

1. Why does a fire go out when a blanket is thrown on it?
2. Why is it a good plan to keep the flues of the stove clean?
3. Why does it check a fire to put cinders on it?
4. Why does water put out a fire?
5. Why do you throw sand on burning gasolene?

PROJECT VI. WHAT HAPPENS WHEN A SUBSTANCE BURNS, AND WHAT IS LEFT?

Problem 1. Do Fuels Weigh Less After They Are Burned?

Class Experiment.

Substitute for one of the pans of a simple horn-pan balance, a tin cover. Pour a teaspoonful of magnesium

powder on the tin scale pan, and exactly counterbalance with sand on the other pan. Now heat the metal scale pan gently with a Bunsen burner, until the magnesium takes fire. Remove the flame and watch the result.

How does the magnesium burn? What is its color? What is the color of the substance left on scale pan? Are the scales balanced now? Why? What must have happened? What sort of compound is formed when magnesium burns? Does every product of combustion weigh more than the substance burned? Why? Is this result always apparent? Why? Would every product of combustion contain oxygen? Why?

Conclusion.

A combustion of oxygen and some other element is called an oxide. Hence the product of combustion here is magnesium oxide. What were the products when sulphur burned? Iron?

The products of combustion always weigh more. If these products are gases, and not solids like magnesium oxide, they go off into the air, and we see no evidence of an increase in weight. When oxygen unites with another element, the process is called oxidation.

PROBLEM 2. WHAT HAPPENS TO CARBON WHEN IT BURNS?

Class Experiment.

Take a piece of charcoal. Of what substance is this charcoal chiefly composed? Collect two bottles of oxygen. Force the sharp end of a deflagrating spoon through a piece of heavy cardboard, a little larger than the mouth of the bottle. Take a piece of charcoal the size of a match. Ignite it, until it glows a bright red. Put the burning charcoal into the spoon, and thrust into the bottle of oxygen. Cover the mouth of the bottle with the cardboard.

Carefully note the size of the charcoal when it is

inserted into the bottle of oxygen. Tell what happens. Watch until the charcoal stops burning.

Is the piece of charcoal as large now? Of what is charcoal chiefly composed? Can this carbon get out of the bottle? Why did the carbon stop burning? Where are the carbon and oxygen now?

Remove the deflagrating spoon and charcoal. Pour about half an inch of clear lime water into the bottle, and shake. Pour some lime water into the bottle of oxygen and shake. What happens? Does the bottle in which the charcoal was burned contain anything which the other bottle does not? What causes the milky color? How must this new gas have been formed? Of what elements is it composed? What is it?

Conclusion.

Charcoal, which is an impure form of carbon, loses in size as it burns, and gives off a colorless gas as a product of combustion. This gas is carbon dioxide. It is formed by the combining of carbon with oxygen.

PROBLEM 3. WHAT HAPPENS TO HYDROGEN WHEN IT BURNS?

Class Experiment.

Prepare a little hydrogen gas by placing some zinc in a bottle, fitted with a two-hole rubber stopper. Through one hole insert a thistle tube and through the other a delivery tube. Pour dilute hydrochloric acid into the thistle tube, and collect a clean, dry, test tube full of gas. Hold the test tube inverted while collecting the gas. Why? Hold over flame. What happens? Did the hydrogen burn? What is left in the tube? Examine it. Where did the new substance come from? What is the product of combustion when hydrogen burns? What is water?

Conclusion.

The product of combustion when hydrogen burns is, of course, hydrogen oxide, or just plain water. In other words, water is made up of hydrogen and oxygen.

PROJECT VII. A CANDLE AND HOW IT BURNS.

Problem 1. How a Candle Burns.

Class Experiment.

Light a paraffin candle. Allow it to burn for several minutes. What causes the hollow crater at the base of the flame? Invert the burning candle. With what is the little crater filled?

Problem 2. How Can Paraffin Go up the Wick?

Pour a small quantity of ink into a butter chip. Hold the end of a narrow strip of blotting paper in the ink for about a minute. Watch the blotting paper at the surface of the ink. Hold the end of a narrow strip of smooth writing paper in the ink. Do you notice any difference? Compare the structure of the blotting paper and writing paper. How can paraffin go up the wick of the candle?

Problem 3. What Is a Flame?

Class Experiment.

Blow out the flame of a candle quickly. Bring a burning match just over the wick. Repeat several times. How far above the wick did you hold the match? What burned first? How does the flame reach the wick? What changes does the paraffin undergo before it burns? What is the yellow flame of a candle?

Problem 4. The Parts of a Candle Flame.

Class Experiment.

How many parts can you see in the flame of a candle? Where are these parts? What is the bright yellow part? What is the dark central part? Take a piece of glass tubing two or three inches long. Hold this piece of glass tubing obliquely, with one end in the dark central part of the flame. Bring a burning match near the other end. What does this show? Why is it impossible for the paraffin to burn in the center of the flame? What part of the flame is really burning?

Problem 5. What Becomes of a Candle When it Burns?

Class Experiment.

(*a*) Hold a clean, dry, cold milk bottle over a candle flame. What do you see inside the bottle? Of what is water composed? Where did the hydrogen come from? Where did the oxygen come from? What happens to these elements when the candle burns? Why do you use a cold bottle?

(*b*) Hold the bottom of a clean white plate in the yellow flame of a burning candle for about a minute. Examine the bottom of the plate. What is this substance? Where does it come from? What does it show concerning the composition of paraffin?

(*c*) Hold a milk bottle over a candle flame, and then quickly pour lime water into it, to a depth of half an inch. Shake. Does the lime water remain clear? What must have been formed by the burning candle? To produce carbon dioxide, what substance must have burned? Where does the carbon come from? Where does oxygen come from? What happens to these elements when the candle burns? What then becomes of the candle when it burns?

Conclusion.

Before the paraffin can burn it is heated and changed into a liquid. This flows up the wick, as ink flows up into the blotting paper. Here the heat of the flame changes the liquid to a gas, which burns, and gives us the characteristic yellow flame. The yellow part of the flame is the part where oxidation is taking place. The dark central part is the gas before it burns. Naturally oxygen can get to the outside only.

When a candle burns, water is produced, showing that the candle must have contained hydrogen, which united with oxygen in burning, to form water. Carbon dioxide is also produced, showing that the candle must contain carbon. That it does contain carbon is further

shown by the soot which collected on the plate. Soot or lampblack is carbon. *Both water and carbon dioxide pass off as gases into the air.*

PROJECT VIII. WHAT ARE OUR COMMON FUELS COMPOSED OF?

Class Experiment.

Light a splint of wood and hold it in a cold, dry, milk bottle. What do you see on the bottle? Where did the hydrogen come from? Where did the oxygen come from? Again hold a lighted splint in the bottle. Pour lime water into the bottle to a depth of half an inch, and shake. What result is produced? What substances must there have been in the bottle? Where did the carbon come from? What do you know of the composition of wood from these two experiments? Repeat the experiment, using a gas flame. A kerosene flame. An alcohol flame. What products of combustion did we find in each? What do you know of the composition of common fuels?

Conclusion.

All these fuels give off water vapor and carbon dioxide as products of combustion. Hence they must contain hydrogen, which unites with oxygen in the air-giving water; and carbon, which unites with oxygen in the air, giving carbon dioxide.

PROJECT IX. HOW DOES A KEROSENE LAMP BURN?

Examine a kerosene lamp at home. Study the parts.

Problem 1. The Parts of a Kerosene Lamp.

Class Experiment.

Point out the principal parts of a kerosene lamp. Explain the use of the following parts: Cistern, burner, central draft, flame spreader, wick and chimney.

Problem 2. How Does Kerosene Go Up the Wick?

Class Experiment.

Partly fill a glass with water. Pour a few drops of ink into the water. Take two short pieces of glass tubing, one piece having a large bore, the other a small bore. Hold the glass so that the surface of the water is level with the eye. Immerse the end of each piece of glass tubing in the water. How does the level of the water in the glass compare with the level of the water in the tubing? How does the level of the water in the glass tubing of large bore compare with the level in the small one? Does this show how kerosene goes up the wick?

Problem 3. What is the Yellow Flame?

Class Experiment.

Remove the chimney from the lamp. Turn up the wick. Light the lamp. With a quick breath, blow out the flame. Now hold a burning match about two inches above the wick. Repeat several times. What does this prove concerning the yellow flame?

Problem 4. Why is a Chimney Used on a Lamp?

Class Experiment.

Light the lamp. Put on the chimney. Turn up the wick until there is a large, even, steady flame. Remove the chimney. How does the lamp burn now? Replace the chimney. Hold a smoking splint under the burner. Where does the smoke go? What does this prove? How can air stop the smoking of the flame? Why does the flame get more air when the chimney is on the lamp? What causes the air to pass through the chimney?

Conclusion.

The kerosene goes up the wick in the same way as paraffin in the candle, and ink in the blotting paper. The smaller the size of the hole, the higher the liquid

rises. Here the kerosene, which has been changed into gas, gives us the yellow flame. Air goes in through the burner, and up the central draft. Without the chimney, there is not a steady flow of air, and we have a smoky flame.

Questions.

1. Why is it necessary to trim the wick of a lamp?
2. Why does the flame go out when you blow it?
3. Why does the flame go out when you put your hand on the top of the chimney?
4. Why should the little holes in the burner be cleaned frequently?
5. What makes a lamp smoke?
6. Why is the inside of the chimney covered with a fine mist when the lamp is burning in a cold room? Why does this mist disappear in a warm room?
7. Does the height of the chimney affect the burning of the kerosene?
8. How should a lamp be filled?
9. How does the burning of a lamp affect the air of the room?
10. What is lampblack?

PROJECT X. HOW WOOD BURNS.

Watch the burning of wood in the coal range or fireplace at home. Note carefully each step. What burns first? What is this? What burns next? What is this? What is left after the wood is burned? What becomes of the rest of the wood?

Class Experiment.

Place four bricks on the table. Upon these lay a piece of sheet iron. Kindle a small fire in the center of this. Watch the fire burn.

(*a.*) What are the yellow flames? Fill a test tube about one quarter full of wood shavings. Bend a short piece of glass tubing at right angles. Push one end of

the tubing through the hole in a stopper. Close the test tube with the stopper. Heat the test tube evenly and slowly over a flame. Hold a burning match just above the open end of the glass tubing. What happens? What is this substance? Where does it come from? What are the yellow flames when wood burns? Why do the yellow flames die down, after the wood has burned for a short time?

(*b.*) What are the black coals? Of what are the coals composed? What does this show concerning the composition of wood? Will these black coals burn? Why are they frequently left when the fire goes out?

(*c.*) What are the red coals? Ignite a piece of charcoal. What color does it become? Why does it burn without flames? How does carbon burn?

(*d*) What is left after the wood burns? Examine some of this substance. Describe it. Why didn't it burn? Where did the tree obtain this substance? What is it used for?

(*e*) What is smoke? What do you find inside the flues of the smoke pipe of your coal range? What is this substance?

Light a kerosene lamp. Put on the chimney. Turn up the wick so that the flame smokes. Examine the inside of the chimney. Why was this substance formed? Does the flame smoke when the wick is turned down? Why?

Conclusion.

The products of distillation of wood are charcoal, gas and tar. If there is insufficient oxygen, some charcoal is left. In ordinary combustion it is burned to carbon dioxide. Charcoal burns with a glow and no flame, as all the gas has passed off. In a flame with an insufficient supply of oxygen, carbon is deposited as soot. It gives us smoke when it is carried off with the air currents.

QUESTIONS.

1. Why does wood snap when it burns?
2. What causes smoke when the fire is first kindled?

3. Why do the flames of a large fire shoot up so high into the air?
4. What is the smoke of a burning match, when you blow out the flame?
5. Explain why chimneys sometimes catch on fire.

PROJECT XI. HOW COAL BURNS.

Make all the observations you can of a coal fire at home, in the heater or range. What kind of coal was used? How does it burn? What are the yellow flames? The blue flames? Red coals? What is left in the stove after the coal is burned? What has become of the rest of the coal?

Class Experiment.

For a realistic development of this project, obtain permission for the class to study the burning coal in the furnaces of the schools.

(*a*) Examine the coal. What kind is it? Is it the same as you use at home? Why? How does it differ?

(*b*) Throw several shovelfuls of fresh coal on the fire. What happens before the coal begins to burn? What is the effect on the fire? What are the yellow flames? How do soft coal and hard coal compare, as to the amount of yellow flame? Why do the yellow flames die down? What is then burning? Which lasts the longer?

(*c*) What are the products of combustion? What does the color of the coal indicate as to its composition? What becomes of this element? Coal contains hydrogen. What becomes of the hydrogen when it burns? What then are the products of combustion?

(*d*) Examine the ash pit. What do you find? Why is this substance left? Where did it come from? Do you find any slate or shale? Where did this come from? What are the clinkers?

(*e*) What are the blue flames? When coal burns with a limited supply of oxygen, some carbon monoxide

is formed, which burns with a blue flame. It is exceedingly poisonous. Have you seen these blue flames in your coal stove? What precautions should you take in checking the fire for the night?

Conclusion.

Soft coal contains more hydrocarbons than hard coal. After the gas has all burned we have the glow of burning carbon. The blue flames are carbon monoxide burning. The products of combustion here are carbon dioxide and water. The ash represents the mineral matter which will not burn.

PROJECT XII. HOW TO PUT OUT A FIRE.

Problem 1. How a Fire Extinguisher Puts Out a Fire.

Home Experiment.

Pour a half inch of vinegar into a common drinking glass. Now add a teaspoonful of baking soda. Hold the palm of the hand over the glass. Describe the action that takes place. What are the bubbles? Why does the foam rise and then settle again?

Light a match. Remove the hand from the top of the glass. Thrust the flame into the glass. What is the result? Describe the substance formed by the action of soda and vinegar. Could this same substance be used in a fire extinguisher?

Problem 2. How the School Fire Extinguisher is Made.

Examine the fire extinguisher in your school. Unscrew the cap and lift off. Examine the bottle of sulphuric acid. See that the barrel of the extinguisher is filled with water with soda dissolved in it. What happens when the extinguisher is turned upside down? What comes out of the hose? Why?

Problem 3. What Substance is Thrown Out from a Fire Extinguisher?

Class Experiment.

Fill a wide mouth bottle one third full of water, and add a teaspoonful of soda. Shake the bottle until the soda is dissolved. Close the mouth with a two-hole rubber stopper. Through one hole force a thistle tube, until the end is well covered with the solution in the bottle. Through the second hole force a short piece of glass tubing, to which is attached a piece of rubber tubing, two feet long. Let the end of this delivery tube be placed in a shallow pan of water. Fill a bottle with water and invert it over the mouth of this tube. Now pour sulphuric acid into the thistle tube, a few drops at a time.

What is the action in the bottle of water? What action takes place in the bottle of soda solution? What kind of substance is being formed? What is its color? What makes the water go out of the bottle? Cover the bottle of gas with a cardboard, and remove to the table. Test with a burning match. Now pour some lime water into the bottle and shake. What does this show?

Conclusions.

When acids, such as vinegar or sulphuric acid, mix with a substance like soda, a gas comes off, which is not a supporter of combustion or combustible. This gas is carbon dioxide. This principle is utilized in the fire extinguisher, where sulphuric acid is poured over a soda solution when it is inverted.

Questions.

1. What gas is formed in this experiment?
2. Why does it put out a fire?
3. Why are the contents of a fire extinguisher forced out so violently?
4. Why must a fire extinguisher be inverted?
5. How is a fire extinguisher recharged?

SPECIAL SUPPLIES AND APPARATUS.

Phosphorus, yellow.
Sulphur.
Magnesium powder.
Baking soda.
Sulphuric acid.
Kerosene lamp.
Deflagrating spoon.
Forceps.

REFERENCES.

Science for Beginners. Barber. Henry Holt & Co.
Junior Science. Hessler. Benj. H. Sanborn & Co.
An Introduction to the Study of Science. Smith & Jewett. The MacMillan Company.
Everyday Science with Projects. Snyder. Allyn & Bacon.

SCHOOL DOCUMENT NO. 8—1922

BOSTON PUBLIC SCHOOLS

GENERAL SCIENCE FOR INTERMEDIATE CLASSES

PAMPHLET No. 11—HEAT

BOSTON
PRINTING DEPARTMENT
1922

In School Committee, Boston, July 5, 1922.

Ordered, That the three accompanying pamphlets of a series of courses in science for intermediate schools and classes,

No. 10. Fire,
No. 11. Heat,
No. 12. Sound,

are hereby authorized to be printed as school documents.

Attest:

THORNTON D. APOLLONIO,
Secretary.

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GENERAL SCIENCE FOR INTERMEDIATE CLASSES.*

This outline of work has been prepared by a council, comprising teachers in the high, intermediate and elementary schools of the city, under the supervision of Mr. Arthur L. Gould, Assistant Superintendent. The members of the council are as follows:

JOSEPH R. LUNT, *Chairman* . English High School.
GEORGE W. GAMMON, *Secretary*, John Marshall School.

Representing the high schools:

CHARLES H. STONE, JR. . . English High School.
RALPH C. BEAN . . . . . Girls' High School.
FRANCIS E. MASON . . . . High School of Commerce.
ADELBERT H. MORRISON . . Mechanic Arts High School.
DENNIS C. HALEY . . . . Roxbury High School.
LILLIAN J. MACRAE . . . . South Boston High School.
THOMAS P. DOOLEY . . . . West Roxbury High School.

Representing the intermediate schools:

GERTRUDE V. NUGENT . . . Emerson School.
JOEL W. REYNOLDS . . . George Putnam School.
ETTA A. MANNING . . . . John Winthrop School.
MARY M. BYRNE . . . . Lewis School.
MELZAR H. JACKSON . . . . Mary Hemenway School.
CATHERINE T. HUNT . . . Robert G. Shaw School.
ESTHER M. LARSON . . . . Ulysses S. Grant School.

Representing the elementary schools:

MABEL A. WOODWARD . . . Christopher Gibson School.
S. ALBERT CRAGIN . . . . Dearborn School.
CHARLES H. EARLY . . . . Henry Grew School.
FREDERIC H. BUCK . . . Mather School.
FRANCES M. MURPHY . . . Phillips Brooks School.
WILLIAM R. KRAMER . . . Prescott School.
BERTHA C. QUINNAM . . . Roger Wolcott School.
SIDNEY T. H. NORTHCOTT . . William E. Russell School.

* This pamphlet was prepared by RALPH C. BEAN, Girls' High School, JOSEPH R. LUNT, English High School, and SIDNEY T. H. NORTHCOTT, William E. Russell School.

PREFACE.

Heat, whether produced by the sun or by artificial means, will always remain a subject of thought for mankind. To obtain a source of heat to warm his home and cook his food has been, and always will be, of prime importance to man.

Power depends upon heat. Without power progress would cease; for power is essential for transportation and manufacturing.

Light also depends upon heat. Gas is taken out of soft coal and used to furnish the brilliance of the Welsbach mantle. Heat generated by coal makes steam to run powerful turbines. These turbines operate electrical generators, that make the electricity for the lighting of streets and homes.

How heat travels from place to place, and the many practical applications of heating appliances, form the basis for a series of experiments, which always prove interesting. The study of illuminating is a project that is especially worth while.

It is hoped that these experiments will be suggestive and helpful, not only in stimulating interest, but also in leading to a better understanding of the environment about us.

PROJECT I. THE DRAFT AND HOW IT WORKS.

Problem 1. How Heat Affects Air.

Class Experiment.

Through the hole in a one-hole rubber stopper push the end of a piece of glass tubing. Fit the stopper securely into the mouth of a flask. Place the open end of the glass tubing into a dish of water. Gently heat the flask all over with a Bunsen flame, moving constantly to prevent cracking the flask.

What do you see? What are the bubbles? Where do they come from? Why are they driven out of the flask? What is the effect of heat on air?

Still keeping the end of the tube in water, remove the flame and allow the flask to cool. What happens now? How do you explain this? How does heat affect the air in a coal range?

Problem 2. What Causes Circulation?

Class Experiment.

Take two Erlenmeyer flasks of the same size. Fasten a loop of fine wire about the neck of each, and suspend from each arm of an equal arm balance. Be sure they exactly balance each other. Now move a Bunsen flame over the outside of one of the flasks for a few seconds. Remove the flame.

Which flask is heavier? Allow the heated flask to cool. Why do the flasks balance again? What do these flasks contain? Why is cold air heavier than warm air?

Problem 3. Why Does A Stove Draw?

Make a wooden box approximately 12 inches by 4 inches by 3 inches. Cut two circular holes, 2 inches in diameter, in the top cover, one near each end of the box. If a piece of glass be fitted into the front of the

box the class can see what happens inside. Place two candles directly under one of the holes. Light the candles. Set a tall lamp chimney over each hole. Melted paraffin may be dropped around the base of each to make it tight. Hold a smoking cotton cloth, in turn, over each chimney. Watch the smoke. Which way does the smoke go? How do you explain this?

What effect do the candle flames have on the air in the chimney above them? Explain why the air circulates as it does in the box. Does this help to explain currents in the air on a large scale, called wind?

Conclusions.

Heat causes air to expand. Therefore hot air is lighter than cold air. Heavy cold air will push lighter warm air out of the way. This starts a convection current. The warm air in a chimney is lighter than the colder air outside, and so the colder air pushes in through the stove, and causes a draft.

QUESTIONS.

1. Why does smoke go up the chimney?
2. Why do factories have high chimneys?
3. What makes the fire roar?
4. Why does a stove sometimes smoke when you start the fire?
5. Why is the draft stronger when the kitchen is cold?
6. What causes the draft in a fireplace?
7. Why do you use a chimney on a lamp?
8. Why does a hot air balloon rise?
9. What makes the wind blow?
10. How are sea breezes, near the ocean, produced during the daytime?

PROJECT II. THE KITCHEN STOVE.

PROBLEM 1. HOW IS A ROOM HEATED BY A STOVE?

Home Experiment.

Close all the windows and doors. Take a smoking stick and test the air currents by watching the direction

in which the smoke goes. Make a drawing and indicate by arrows the direction of the current. Try above the stove, beside the stove, near the ceiling, near a window on the outside wall, and near the floor between outside wall and stove.

Where is the warmest part of the room? The coldest? Why must windows and doors be closed? If a window is opened, what is the result? Why is it possible to "air" a room very quickly on a cold day in winter?

PROBLEM 2. HOW TO ADJUST THE DAMPERS OF A STOVE.

Home Experiment.

(*a*) With a fire burning in the kitchen range, open the ash door slide, check damper, and direct draft damper. Hold a smoking stick before the openings in the ash door. Watch the smoke. Remove the top covers over the fire. Hold the smoking stick just over the burning fuel. Where does the smoke go? What enters the openings in the ash door? Where does it go? What causes this circulation? Why does the smoke go up the chimney?

(*b*) Close the oven damper, and try to discover the direction of the circulation. Why do the hot gases go this way? What effect has the closed damper on the fire? What effect has this on the oven?

Conclusions.

In a room heated by a stove, the air over the stove rises, passes along the ceiling, and comes down the cold outside walls back again toward the stove. Inside the stove the currents are directly up the chimney when the direct draft damper is open. When the oven damper is closed, the hot gases must pass around the oven before they escape. By this means the oven is heated.

PROJECT III. HOW DOES A HOT AIR FURNACE WORK?

Examine a hot air furnace at home or in a friend's house. Trace as far as possible the path the smoke

travels to the chimney. Trace also the hot air pipes leading from the furnace.

What heats the rooms? How does the hot air get there? How does the air become heated? Where does the air come from? What would be the effects of any cracks in the furnace casting? Is the heat always evenly distributed?

Conclusions.

The hot-air furnace is dependent on a convection current of air to heat the house. It has certain advantages over hot water or steam: It costs less to set up; it has nothing to freeze; it ventilates as well as heats.

A hot-air furnace has also certain disadvantages. It makes more dust in the house. It does not always distribute heat evenly when the wind is blowing in certain directions. It may leak carbon monoxide, if there are cracks in the casting. Carbon monoxide is a poisonous gas produced in the furnace. It is dangerous to let it escape into the air we breathe.

NOTE.— Use a large diagram of a hot-air furnace for the class work on this project.

PROJECT IV. WHY DOES A REFRIGERATOR KEEP FOOD COOL.

Home Experiment.

Examine a refrigerator at home and make a diagram. Where is the ice placed? Why? How are the walls made? Why? Would it be better if the ice did not melt at all? What is the effect of the melting ice on the air next to it? What does the air do then? Why? What happens to the warmer air which is pushed away from the food? How long will this circulation last? Does every refrigerator have such a circulation? Is it an advantage to wrap the ice in newspapers? Why?

Conclusions.

The refrigerator shows how a convection current may start from cooling as well as heating. Without circula-

tion of air the food would not be kept cool and would spoil. The better nonconductor the walls are, the less ice will be melted by the heat of the room.

PROJECT V. HOT WATER HEATING.

Problem 1. How Heat Affects Water.

Class Experiment.

Through the hole in a one-hole rubber stopper push the end of a long piece of glass tubing. Fit the stopper securely into the mouth of a flask full of water. Heat the flask with a gas flame, gently at first. Watch the tube. If the water is colored with red ink, it can be seen by the class better.

What do you see? Where does the water that goes up the tube come from? What is the effect of heat on water? How does the speed of expansion compare with that of air?

Allow the water to cool. What happens now? Explain.

Problem 2. What Makes Water Circulate.

Take two Erlenmeyer flasks of the same size and weight. Fill one with cold water and the second with hot water. Balance on the equal arm balance. Which is heavier? Allow the flask of hot water to cool. Do the flasks now balance? Why is cold water heavier than warm water?

Problem 3. How a Hot Water System Works.

Class Experiment.

Fill a piece of apparatus,* consisting of a glass tube in the form of a rectangle, with water. Put in some sawdust so that the movement of the water may be seen easily. Heat at one side with a gas flame. How do the sawdust particles move? Can you explain? Why is a bulb at the top necessary? How long will the circulation continue?

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*See Pamphlet 1—Apparatus.

Problem 4. How Water Circulates in a Hot Water Tank.

Examine the hot water tank at home and its connections. What part of the tank has the hottest water? What causes the circulation? Why is an expansion tank needed? Where is it located?

Conclusions.

Heat causes water to expand. Therefore, hot water is lighter than cold water. The heavier cold water will push the lighter warm water out of the way. This is called a convection current.

Questions.

1. In hot water heating why does the hot water rise to the radiators?
2. How soon after building the fire will this circulation start?
3. When the warm water has cooled in the radiators where does it go? Why?

PROJECT VI. HOW HEAT TRAVELS BY CONDUCTION.

Problem 1. How Heat Travels Through Metals.

Class Experiment.

Let a pupil hold an iron and a copper rod (two feet long), one in either hand. Let the ends be heated in a gas flame.

Which rod begins to feel warm first? What is the condition of the iron rod when the copper is too hot to hold with comfort? Let the pupil run his finger along the iron rod cautiously.

For the sake of comparison let another pupil hold a glass rod of about the same size in the flame, until the glass becomes plastic, and begins to bend. Does the glass get warm where it is being held? Run the finger along the rod. How near the heated spot can the finger

be placed without burning? How does the glass compare with iron and copper in conducting heat?

The same experiment may be repeated using a burning match held in the fingers. Is wood a good conductor?

Take a dish of hot water, and procure three spoons, one silver, one plated, and one aluminum. Put them into the hot water with just the handles sticking out. Ask pupils to pick out and tell which spoon feels the hottest. Why is it so easy to burn yourself on aluminum cooking utensils? How can you tell solid silver from plated silver when washing dishes? Why do some kettles have wooden handles? Why do you use a holder? Why does an iron pump handle in winter appear to be so much colder than a wooden one?

Problem 2. How Water Conducts Heat.

Take a large test tube of water and heat at the top until it boils. Let the pupils feel the top and bottom of the tube. Why is the bottom cold? Why was there no heating by convection? Explain how a teakettle of water is heated.

Conclusions.

The best conductors of heat are the metals. Of these copper and aluminum hold the highest place. Both wood and glass are poor conductors. Water is a very poor conductor. All gases, including air, are the poorest conductors of heat. Our clothes are poor conductors because of the air imprisoned in the fibers of the material of which they are made. On this account clothing keeps us warm, by not allowing the heat of our bodies to escape.

PROJECT VII. HOW HEAT TRAVELS BY RADIATION.

Problem 1. To Show Radiation.

Home Experiment.

Open the furnace door when there is a good fire. In which direction does the air move? As you look

in, can you feel the heat? Is it due to convection? Knowing that air is a very poor conductor, do you think this is conduction?

Class Experiment.

Heat a piece of iron in the gas flame until it begins to show red. Suspend it from a ring stand, and hold one hand on all sides of the hot iron to see if the heat comes in any particular direction best. Hold up a pane of glass. Hold up a notebook. Which one cuts off the heat?

NOTE.—The best illustration of radiation is, perhaps, the heat which the earth receives from the sun through 93,000,000 miles of space, where there are no material particles to conduct or to carry a convection current.

PROBLEM 2. WHAT SORT OF SURFACE SHOULD A RADIATOR HAVE?

Class Experiment.

Take a tin can and blacken one side with soot, halfway around. Leave the other half shiny. Fill with boiling hot water. Let pupils hold their hands near it, one a half inch from the polished surface, the other a half inch from the blackened. Is there any difference in the sensation of heat? Which side allows heat to escape the more readily? What sort of surface should a radiator have? What sort of surface should furnace pipes in the basement have?

PROBLEM 3. WHAT SORT OF SURFACES ABSORB HEAT BEST?

Class Experiment.

Take two pieces of bright tin of the same size. Cover one piece, on one side, with soot. On the back of each attach a piece of chalk with hot candle wax. Now suspend one on either side of a red hot piece of iron. Let the soot-covered side of one tin face the hot iron.

Let the shiny side of the other tin face it. What happens? Why does not the chalk fall from the shiny tin? Why should a teakettle be polished above and black beneath?

PROJECT VIII. A STUDY OF ILLUMINATING GAS.

Problem 1. How Is Coal Gas Made?

Class Experiment.

Grind to a powder some soft coal, and place it in a large test tube to a depth of about two inches. Clamp the tube on the ring stand. Heat slowly and evenly. Observe the interior of the tube carefully. What is the first result of heating? What is the next result?

Light the mouth of the tube. What sort of flame do you get? Does it change in character? How? Does the escaping gas change in color? How? What is driven off from the coal? Why does it not burn in the test tube?

Break the test tube. Describe the substance you find there. What is it? Why is it left in the test tube? Explain how coke is made. What are the little holes in coke?

Examine the interior of the test tube near the mouth. Describe the substance you find there. What is it? Note the odor. Can you name the substance? What substances are obtained from coal by this experiment? Is this combustion? Why?

Conclusions.

The principal products formed by heating coal in a retort are gas, tar and coke. This process is called destructive distillation. From the tar we get by fractional distillation a number of by-products, like carbolic acid, which serve as a starting point for many drugs, dyes and chemicals.

Questions.

1. What are the products of combustion when coal burns?
2. Why are they different here?
3. Is it possible to obtain gas from wood?
4. Why is anthracite coal not suitable for making gas?
5. Why doesn't the gas burn as it is being made?
6. How is gas stored?
7. Why is it necessary to purify coal gas?
8. Do you use illuminating gas at home?
9. What is water gas?
10. Where is this gas made?
11. Why does coke burn without a yellow flame?
12. Where do the following products come from:

Ammonia.	Carbolic acid.
Creosote.	Aniline dye.
Saccharine.	Tar paper.

Acetanilid of headache powders.

Problem 2. What Are the Properties of Illuminating Gas?

Class Experiment.

(*a*) *What is the color of illuminating gas?* Fill a wide mouth milk bottle with water, and invert in a dish of water. Attach a rubber tube to the gas pipe and insert the open end under the edge of the bottle. Turn on the gas. Why does the water go out of the bottle? With what is the bottle now filled? Examine the gas in the bottle. What color is it? Can you see illuminating gas? Has it any odor? Have you any proof that illuminating gas is harmful to breathe?

(*b*) *Does illuminating gas support combustion?* Collect a bottle of gas and place it on the table. Fasten a candle to a piece of wire and light it. Lower the burning candle into the bottle of gas, until it nearly touches the bottom. Does the candle burn now? Will illuminating gas support combustion?

(*c*) *Will illuminating gas burn?* Fill a wide mouth bottle, as before, with illuminating gas, and place it on the table. Hold a burning match just over the mouth of the bottle. What happens? Cover with a glass or tin plate. What happens? Repeat till all gas is used. Will illuminating gas burn? Why does it burn at the mouth of the bottle? Light the gas at the end of the gas pipe. Where does the gas burn? Why doesn't it burn inside the pipe?

(*d*) *Why leaking gas is dangerous.* Take a pound coffee can with a tightly fitting cover. Make two holes in the can, half an inch in diameter, one hole in the center of the cover, the other hole in the side of the can near the base. Attach a piece of rubber tubing to the gas pipe. Insert the end of the rubber tubing in the hole in the side. Fill the can with gas. Now hold a burning match at top hole. Watch gas burn. *Caution — stand several feet away from can.*

As the gas burns, describe the changes in the color of the flame. What finally happens? How do you explain this action? Why did you make a hole in the side of the can? Why does the flame change from yellow to blue? Why doesn't the gas explode when you first light it? What are the relative quantities of air and gas when the explosion takes place? Is it safe to hunt for gas leaks with a candle or match?

Conclusions.

Illuminating gas is colorless, a non-supporter of combustion, combustible, and when mixed with air forms an explosive mixture.

Problem 3. How Illuminating Gas Burns.

Class Experiment.

(*a*) *Examine a Bunsen burner.* Identify the mixing tube, air ports, air shutter, and gas orifice. Connect the burner to the gas pipe with rubber tubing. Light the gas at the orifice. Describe how it burns. Screw the mixing tube on again.

(*b*) *Close the air shutter.* Light the gas. What color is the flame? Hold a clean white dish in the flame for a few seconds. What collects on the dish? How can you explain this? Where does the gas obtain the air necessary for combustion?

(*c*) *Open the air shutter.* What is the color of the flame now? How many parts do you see in the flame? What is the outer cone? What is the inner cone? What causes air to rush into the air ports? How do the sizes of the air ports and gas orifice compare? What are the relative quantities of gas and air in the mixing tube? Does the blue flame obtain its air supply from any other source? Hold a clean white dish over this flame for a few seconds. Do you get soot here? How do you explain this? Which kind of flame do yo use at home in your gas range?

(*d*) *What makes a gas flame yellow*? Light a Bunsen burner and open the air ports. Grind some charcoal to a powder and sprinkle some of this in the blue flame. What color does it give the flame? Of what is charcoal composed? What happened to these grains of charcoal when they were sprinkled in the flame? Close the air ports. Hold a clean white dish in the flame. What forms on the dish? Why? To what is the color of the flame due?

Conclusions.

When the Bunsen burner has the air ports closed we get a yellow flame like a candle. When the ports are open we have a sufficient supply of air to make the combustion complete, and so have a blue flame. The yellow color is due to particles of carbon heated white hot in the flame. When these are cooled below the kindling point they are deposited as soot.

Problem 4. What Kind of a Flame is Better for Cooking.

Hold a piece of glass tubing in the yellow flame. What collects on the tube? Why does it collect here?

What is the objection to the use of such a flame for cooking? Can you give two reasons?

Now hold the soot-covered tube in a blue flame. What happens? Why? Why does glass begin to bend? Which flame is hotter? Why? Which flame is better for cooking? Why?

Conclusion.

The blue flame is clean and deposits no soot. It is hotter than the yellow flame. Hence the blue flame is desirable for cooking.

PROBLEM 5. HOW TO READ A GAS METER.

(*a*) *Find the gas meter at home.* How many dials do you find? How many cubic feet are registered by each dial? Into how many divisions is each dial divided? In what direction does the hand of each move? Copy dials and hands for the next exercise.

(*b*) *How do you read the meter?* The hands move as gas passes through the meter. When no gas passes there is no motion. The dial marked 1,000 is divided into 10 divisions, each representing 100 cubic feet. This is as close as the meter is ever read. On the 10,000 dial the hand moves only one division, while the hand on the 1,000 dial moves clear around, and hence moves only one-tenth as fast. In other words, the 1,000 hand moves 10 times around to the 10,000 hand once.

Read the 1,000 foot dial. Does the hand move to left or right? What is the last number this hand has passed? Read the middle dial. In what direction does the hand move? What is the last number this hand has passed? Read the next dial. In what direction does this hand move? What is the number this hand has passed? What is the total reading? Why do you add two zeros?

If the hand is directly on a number, read that number; but it will not be directly on a number unless the hand of the preceding dial has passed zero. If before zero, read the smaller number.

In short, read the number just passed in order, and add two zeros.

Problem 6. How to Compute a Gas Bill.

Meters are read each month, but not necessarily on the first day of the month.

Find an old gas bill at home. What is the cost per 1,000 feet? How many readings did the gas company take to compute the bill? When were these readings taken? Why was subtraction used? How many cubic feet of gas did you use?

Is there a quarter prepayment meter in your house? How much gas should you get for a quarter? How can you verify this?

Conclusion.

To compute a gas bill, subtract last month's reading from this month's. Then multiply by the cost per 1,000 cubic feet (at present $1.35) and divide by 1,000.

Problem 7. How to Use Gas for Boiling.

Class Experiment.

Take two small kettles of the same size and put into each the same quantity of water, till each kettle is about one-half full. Light three Bunsen burners and place one under the first kettle and two under the second. When the water is boiling in both kettles, drop several pieces of potato of the same size into each. Examine from time to time so as to find out when they are cooked soft.

Compare the two kettles in reference to number of burners used, quantity of gas used, amount of heat generated, how the water boils, time it takes to cook the potatoes, and amount of water left.

What cooks the potatoes? Do the potatoes cook quicker in one than in the other? Take temperature of water in each kettle. Why is temperature the same? Which kettle has the greater amount of water left? Compare cost of cooking potatoes in each case. What have you learned?

Conclusions.

No matter how violently the water boils, the temperature will not go any higher in an open kettle. Hence it is a waste of gas to use it just to evaporate water without an increase in temperature.

SPECIAL APPARATUS.

Lamp chimneys (2).	Convection apparatus.	Bunsen burners (3).
Wooden box.	Iron rod.	One-quart agate ware kettles (2).
Candles (2).	Copper rod.	

REFERENCES.

Science for Beginners. Barber. Henry Holt & Co.
Junior Science. Hessler. Benjamin H. Sanborn & Co.
An Introduction to the Study of Science. Smith & Jewett. The MacMillan Company.
Everyday Science with Projects. Snyder. Allyn & Bacon.

SCHOOL DOCUMENT NO. 9—1922

BOSTON PUBLIC SCHOOLS

GENERAL SCIENCE FOR INTERMEDIATE CLASSES

PAMPHLET No. 12—SOUND

BOSTON
PRINTING DEPARTMENT
1922

In School Committee, Boston, July 5, 1922.

Ordered, That the three accompanying pamphlets of a series of courses in science for intermediate schools and classes,

No. 10. Fire,
No. 11. Heat,
No. 12. Sound,

are hereby authorized to be printed as school documents.

Attest:

THORNTON D. APOLLONIO,
Secretary.

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GENERAL SCIENCE FOR INTERMEDIATE CLASSES.*

This outline of work has been prepared by a council, comprising teachers in the high, intermediate and elementary schools of the city, under the supervison of Mr. Arthur L. Gould, Assistant Superintendent. The members of the council are as follows:

Joseph R. Lunt, *Chairman*	English High School.
George W. Gammon, *Secretary*.	John Marshall School.

Representing the high schools:

Charles H. Stone, Jr.	English High School.
Ralph C. Bean	Girls' High School.
Francis E. Mason	High School of Commerce.
Adelbert H. Morrison	Mechanic Arts High School.
Dennis C. Haley	Roxbury High School.
Lillian J. MacRae	South Boston High School.
Thomas P. Dooley	West Roxbury High School.

Representing the intermediate schools:

Gertrude V. Nugent	Emerson School.
Joel W. Reynolds	George Putnam School.
Etta A. Manning	John Winthrop School.
Mary M. Byrne	Lewis School.
Melzar H. Jackson	Mary Hemenway School.
Catherine T. Hunt	Robert G. Shaw School.
Esther M. Larson	Ulysses S. Grant School.

Representing the elementary schools:

Mabel A. Woodward	Christopher Gibson School.
S. Albert Cragin	Dearborn School.
Charles H. Early	Henry Grew School.
Frederic H. Buck	Mather School.
Frances M. Murphy	Phillips Brooks School.
William R. Kramer	Prescott School.
Bertha C. Quinnam	Roger Wolcott School.
Sidney T. H. Northcott	William E. Russell School.

* This pamphlet was prepared by William R. Kramer, Prescott School, and Mabel A. Woodward, Christopher Gibson School.

PREFACE.

We come into direct relation with the world through our senses. Through two of these, sight and hearing, we receive impressions from a distance, and through these alone do the fine arts appeal to us; through sight, the arts of sculpture, painting, and architecture; through hearing, the arts of poetry and music.

Music gives greater pleasure to more people than any other art; and this enjoyment is of a deeper and more lasting nature. Everyone enjoys music in some degree.

A knowledge of the nature of sound should be of great benefit in the construction of musical instruments. These possibilities are beginning to be shown in the piano and organ.

Some musicians have disparaged and ridiculed the development of mechanical musical instruments, such as the piano-player, yet nothing since the establishment of the equally-tempered musical scale by Bach has contributed so much to the development of musical art. The mechanical operations of the piano has led to a thorough scientific study of music and musical instruments.

Sound is also of great practical importance. We rely upon it continually for the protection of our lives; and through talking, which is simply making sounds according to rule, we receive information and entertainment. The study of sound in language is as old as the human race, and the art of music is older than tradition.

The invention of the telephone and phonograph could never have been developed without a knowledge of the principles of sound.

A useful application of sound is shown in the designs of halls and auditoriums. For of what use is a musical

instrument played by a master musician, or of what effect is faultless oratory, if the surroundings distort and confuse the sound waves?

Sound is intimately associated with the existence of every human being, and while there is a small number of enthusiastic workers in this field, it is nevertheless true that this branch of science has received less attention than it deserves.

These facts amply justify the study of sound, the "material" out of which music and speech are made. Our aim in this pamphlet is to develop an interest in sound and its application to music. Much of the material used in the experiments is furnished by pupils, while some of the musical instruments, such as the guitar, ukelele, xylophone, etc., can be made in a simple way in the manual training room.

A STUDY OF SOUND.

PROJECT I. WHAT MAKES SOUND?

Problem 1. How Sound Is Produced by Talking.

Experiment.

Hold your fingers rather firmly against the front of the throat, while you are talking. What do you notice? What causes this motion?

Problem 2. How A Vibrating Body Produces Sound.

Experiments.

(a) Tap a tuning fork against your desk. Hold one prong against a piece of paper. What happens? What causes the rapid succession of taps? Repeat several times.

(b) Place a tumbler of water on a table. Tap a tuning fork. Touch the water with it. What happens? What causes the tiny waves?

Individual Work.— Construct something which will produce sound, a whistle, or an elastic stretched between two bits of wood. A guitar or ukelele can easily be made by using an empty cigar box.

Conclusions.

Sound is caused by the vibration of some object.

PROJECT II. HOW DOES SOUND TRAVEL?

If you should shout to your playfellow down the street, and he answers, something must have carried to him the vibrations starting from the vocal cords in your throat. What was it?

Problem 1. How Sound Waves Travel.

Experiment.

Stand up, edgeways, rather closely together, a row of dominoes. Tip the first one. The row falls, each one striking the next, and passing on the motion. This represents in exaggerated form what is done by the vibrations of sound.

Problem 2. Can Sound Travel Through a Vacuum?

Experiment.

Under the bell jar of an air pump put an alarm clock hung from a tripod. Exhaust the air before the time for the alarm to ring. Can you hear any real ring? Why not? Admit air while alarm is ringing. Notice the faint sound; then the increase.

Problem 3. How Sound Travels Through Different Materials.

Experiments.

(*a*) Let two people stand by an iron fence about fifteen feet apart. Let one scratch the fence with a pin. Can the other person hear the sound? Put an ear to the fence. Can you hear the sound plainly? Move farther away. Can you still hear it? What must have carried the vibrations? If there is no iron fence at hand, try a wooden one.

(*b*) Place a watch at one end of a long table, or board. Listen at the other end. Explain what takes place.

(*c*) Listen at a trolley pole. Can you hear a car coming at a nearer point, or farther away than ordinarily? Account for your answer.

(*d*) Listen at a trolley pole. Have some one tap the next pole beyond. How many sounds do you hear? What carries the vibrations to your ear? If it is nec-

essary to pass along a railroad track, because of an emergency, you can find out if a train is anywhere near by listening at the track.

(*e*) Make a string telephone. Use two small tin cans. Make a hole in the middle of the end of each can with a nail. Put a string through and make a a knot on the inside of the can to hold the string. Pull tightly. Talk into one can, while the other one is held over the ear of your companion. Do not talk too loud. Experiment with different lengths of string.

Explain what part of the telephone is concerned with this topic. Vibrations of air, started by the vocal cords, strike the diaphragm and make it vibrate the same way. These vibrations are transmitted and reproduced at the other end. Teach correct use of telephone and courteous telephone habits.

Sound is carried from its source to the ear by material substances. Air is one of the most important of these substances.

PROJECT III. VELOCITY OF SOUND.

Problem. How Fast Does Sound Travel?

Experiments.

(*a*) Stand at some known distance from a steam whistle on locomotive or factory. With a stop-watch find the number of seconds between time steam is seen and sound is heard. Divide the distance in feet by the number of seconds to determine the speed per second.

(*b*) Find the distance of a discharge of lightning by using a stop-watch. How will you do this?

Sound travels about 1,100 feet per second in air, or a little more than a mile in five seconds. In liquids and solids it travels much more rapidly.

The velocity of sound can be found approximately by using the apparatus described in Project VI., Experiment 1. Measure the length of the air column which

responds to fork. Multiply that by four, and by the number of vibrations which the fork makes in one second.

PROJECT IV. REFLECTION OF SOUND.

Problem 1. What is Meant by Reflection of Sound?

The vibrations of sound travel out in all directions as a series of waves. Sometimes these waves strike something soft, and are lost. Sometimes they strike something like a cliff, a wall, or a forest; and the sound bounces back again to us. This repeated sound is called an echo. Look up the origin of the word *echo*.

The ancients believed that Echo was a beautiful nymph, the child of Air and Earth, who could once talk like other people. Jupiter asked her to talk to his wife, Juno, and keep her so busy that she would have no time to watch him. When Juno found this out she was angry, and condemned Echo to be able to talk no more, but only to repeat the last word or two that other people said. Later Echo was disappointed in love, and pined away till there was nothing left but her voice.

Experiments.

(*a*) Stand in a small room and shout. Can you get an echo? Does the sound come back? Explain the difference between echo and reverberation.

(*b*) Stand in a large hall and shout. Does it echo? Talk naturally, Can your words be understood across the hall? Stand in several different positions. Do you find any place, that is better than another, to make yourself understood? What change is caused when the hall is filled with people? Where should the speaker stand?

Sound waves are reflected; that is, they rebound from any surface which they strike. The sound of music, or of a person speaking in a hall, is reflected from the walls, but the distance is so short that no echo is heard. The time is so short between the sound that

is produced and its reflection back to the speaker, that they are heard as one sound. A speaker can be more easily heard in a room than out of doors, because in a room the hearers get not only the sound from the speaker, but also its reflection from the walls.

PROJECT V. PITCH OF SOUND.

The pitch of a tone is usually described by the words high or low. We say a man's voice is lower than a woman's, or that a certain whistle has a higher pitch than another. Examine the wires of a piano, and find out what causes their sounds to differ in pitch.

Problem 1. Why Do Sounds Differ in Pitch?

Make a wooden box about three feet long and four inches square at the ends. At one end insert two screws and at the other end two iron pins which can be turned. At a music store, get two violin or guitar strings, of different sizes. Fasten one end of each string to one of the screws, and the other end to one of the iron pins.

1. Experiments with Vibrating Strings.

(*a*) Use one of the strings of the sonometer described above. Tighten the string by turning iron pin until a good tone is produced. Use a bridge to shorten string. Compare pitch of tone produced by the shorter string with pitch of tone produced by the longer string. Try several other lengths. Make rule.

(*b*) Use one of the strings of the sonometer. Tighten until a good tone is produced. Tighten still more by turning iron pin. Compare the pitch of tone produced now with that produced at first. Try several times by varying the tension of the string. Make rule.

(*c*) Use two strings of the sonometer, one being much heavier than the other. Turn iron pins until both strings have about the same tension. Compare pitch of fine string with that of heavy string. Make rule.

2. Experiments with Vibrating Air Columns.

(*a*) Use a wooden model of an organ pipe, or a small tin whistle. Vary length of vibrating air column. Note difference in pitch.

(*b*) Blow across the top of test tubes of same length, but different diameters. Note difference in pitch. Make rule for vibrating air columns.

3. Experiment with Voice.

Have class sing a high and then a low note. Show, by a diagram, the position of the vocal cords, to produce tones of different pitch.

Toy balloons of different sizes can be used in connection with this experiment. These also show why a man's voice is lower than a woman's voice.

The pitch of a sound depends upon the number of vibrations per second. The greater the number of vibrations, the higher the pitch.

PROJECT VI. RESONANCE.

Problem 1. What is Meant by Resonance?

Experiments.

(*a*) Hold a vibrating tuning fork over the mouth of a tall, cylindrical jar. Pour water into the jar, until the sound is much louder. Continue to add water till the sound diminishes in loudness. What is vibrating, together with the fork, when the sound is loudest? Why does this respond only when air column is of a certain length?

Repeat the experiment, using a tuning fork of different size. Note the length of the air column when sound is loudest. Compare with length of air column before.

This principle known as resonance is applied to many musical instruments; such as the flute, clarinet, cornet, etc.

(*b*) Vibrate a tuning fork. Place the end of the fork on an empty box with one end open. Hold your ear near the open end of the box. How does the sound compare with that observed before? What must be vibrating together with the fork?

Such a box is called a resonance box, and the vibrations of the air in the box are called resonant vibrations.

PROBLEM 2. SYMPATHETIC AND FORCED VIBRATIONS.

Experiments.

(*a*) Place a paper rider on one string of a sonometer, both strings being tuned exactly alike. Set the other string vibrating. What happens to the first string? How do you know it is vibrating?

(*b*) Place foot on the loud pedal of a piano, and strike key A. Place a finger on the strings of A, which are vibrating, and listen. What do you hear? How are these tones produced?

Other strings are vibrating in sympathy with those of key A. We call such tones, sympathetic tones.

(*c*) Vibrate a tuning fork. Note the sound. Place the end of the fork on a table. Is there any difference in loudness of sound? Why? The table is forced to vibrate, and makes the sound louder.

This principle of forced vibrations is used in such musical instruments as the pianoforte, zither, etc.

PROJECT VII. KINDS OF SOUND.

PROBLEM 1. HOW DO SOUNDS DIFFER?

Experiments.

(*a*) Let a book fall to the floor.

Clap your hands together two or three times. Suggest a name for sounds of this kind. (Noise.)

(*b*) Strike several chords on a piano, or other musical instrument. Suggest a name for sounds of this kind. (Musical sound.)

Problem 2. How Do Musical Sounds Differ?

Experiments.

(*a*) Use the sonometer. Vibrate a string gently. Use much more force, and vibrate again. How did the first sound differ from the second? Explain the reason for this.

(*b*) Produce tones of the same pitch on various musical instruments. Are the sounds of same kind? In what ways do they differ? Describe each sound as fully as you can. Suggest a name for difference.

(*c*) Review pitch of sound, using the sonometer. In what three ways do musical sounds differ? (Loudness, pitch and quality.)

PROJECT VIII. THE EAR AND THE VOICE?

Problem 1. Of What Importance Is the Ear.

Draw a diagram of the human ear, and trace the course of a sound wave from its source to the auditory nerve.

Name the parts of the ear. How did Bell get his idea of the telephone from the human ear?

Problem 2. Of What Importance Is the Voice?

Draw a diagram, showing the position and action of the vocal cords, when breathing, talking and singing. Discuss the proper care of the ear and the voice.

PROJECT IX. MUSICAL INSTRUMENTS.

Problem 1. How Can You Classify Musical Instruments?

From pupils' observation and experience, name all musical instruments used in orchestras and brass bands.

Group these under the following headings:

String — Violin.
Wood-wind — Flute.
Brass — Trombone.
Percussion — Drum.

If desired, further subdivisions can be made in the string and wood-wind instruments. The instruments may be subdivided into (1) the pianoforte and harp, where the vibrations are produced by striking or plucking the strings, and (2) the violin class, where the strings are bowed.

In the wood-wind, the first class contains the flutes. The second class contains the reed instruments, such as the clarinet and bassoon. Show why each instrument belongs in its own group.

PROBLEM 2. STUDY OF MUSICAL INSTRUMENTS.

Select one instrument in each of the groups under Problem 1. Those instruments in which pupils are especially interested, or in which they are receiving instruction should be preferred.

Such questions as the following can be answered.

Pianoforte.

What are the principal parts of a piano? Of what use is the sound board? Compare the size and length of the bass strings with the treble strings. Why have the bass strings twisted wire round them? How many strings has each note? If a note has more than one string, how must these strings be tuned? How are the strings struck? With what are these hammers covered? Why do the hammers strike the strings near one end, and not in the middle? Explain the action of the pedals, and the effect on the tones produced by piano, etc.

Violin.

What are the principal parts of a violin? How are the strings tuned? To what pitch is each string tuned? How are the tunes of the scale produced? Of what use is the hollow box under the strings? Why has this box such a peculiar shape? Etc.

Flute.

Describe the flute, naming its parts. How is the scale produced? Through how many octaves can the

scale be played? How are the semitones, intermediate between the notes of the scale, produced?

Trombone.

Describe the trombone, naming its parts. What is the shape of the tube nearest the mouthpiece? What is the shape of the end of this tube? What is the effect of drawing out the cylindrical part of the tube? How are the various tones of the scale produced?

Xylophone.

How are the tones produced? Why are the pieces of metal of different size? Etc.

QUESTIONS.

1. Why do timers in a 220-yard dash start their watches by the flash of the pistol, rather than by the report?
2. The interval between seeing a flash of lightning and hearing the thunder was five seconds. How far away was the lightning discharge?
3. A man sets his watch by a steam whistle, which blows at twelve o'clock. The whistle is two miles away. Will his watch be fast or slow? How many seconds?
4. Why is the pitch of the sounds given by a graphophone raised by increasing the speed of the disk containing the record?
5. Why does a megaphone make a louder sound at a distance?
6. Miners entombed by a fall of rock, or explosion, have signaled by taps on a pipe, or by pounding on the rock. How does the sound reach the surface?
7. Why are pianos made so that the hammers strike the wires near one end and not in the middle?
8. Why does the pitch of a sound, made by pouring water into a tall, cylindrical jar, rise as the jar fills?

9. What effect does a rise of temperature have on the pitch of a given organ pipe?
10. Where are the vocal cords? Of what use are they?
11. How is nasal speech produced?
12. Names the parts of the ear, and the use of each part?
13. How do colds and throat diseases affect the ears?
14. Who talks faster, a man or a woman? Why?
15. What causes the snap of a whip?
16. Of what use are the pedals of a piano?
17. Of what use is a horn on a graphophone?
18. How can you produce a high and low pitch on the same string of a guitar?
19. How can you "tune" a violin?
20. Why is there a hollow box under the strings of a violin?
21. Why are the pieces of metal on a xylophone of different sizes?
22. What causes the sound in a drum?
23. Why do you change the positions of your fingers in playing a flute?

INDIVIDUAL PROJECTS.

1. Construct something which will produce a musical sound.
2. Visit a telephone exchange.
3. Build a short distance telephone.
4. Visit several halls. See where the speaker stands.
5. Visit Symphony Hall. Attend one of the concerts arranged for school children. Notice the height and shape of the hall. Name the various musical instruments used in the orchestra. How are these instruments distributed in the orchestra. Draw a diagram to show the arrangement of players and instruments.
6. Construct a megaphone of paper or cardboard.
7. With a jackknife, make a whistle from a piece of green wood.

SPECIAL APPARATUS.

Two tuning forks of different pitch.
Dominoes.*
Air pump.
Small alarm clock.*
String telephone.*
Stop watch.
Sonometer.*
Violin strings.*
Tin whistle.
Wooden model of organ pipe.
Toy balloon.
Test tubes (different lengths and sizes).
Tall, cylindrical glass jar.
Musical instruments.*

REFERENCES.

Elementary General Science. Hodgdon. Hinds, Hayden & Eldredge.
General Science. Elhuff. D. C. Heath & Co.
Sound. Capstick. University Press, Cambridge, Eng.
Collected Papers on Acoustics. Sabine. Harvard University Press.
Practical Acoustics. Barnes. The MacMillan Company.

* Apparatus made or supplied by pupils.

SCHOOL DOCUMENT NO. 10—1922

BOSTON PUBLIC SCHOOLS

SPECIAL SYLLABUS-SHOPWORK

MANUAL TRAINING

GRADES VI., VII., VIII., IX.

MECHANIC ARTS

GRADES VII., VIII., IX.

PREVOCATIONAL

GRADES VI., VII., VIII.

1922-1923

In School Committee, July 5, 1922.

Ordered, That the accompanying revised Special Syllabus-Shopwork for Grades VI. to IX., is hereby adopted for elementary schools, intermediate schools and classes, and prevocational classes, and that eight hundred fifty (850) copies be printed as a school document.

Attest:

THORNTON D. APOLLONIO,
Secretary.

SHOPWORK FOR GRADES VI., VII., VIII., IX.

INTRODUCTION.

There is now ample opportunity for specialized shopwork beyond the elementary and intermediate schools. The Boston Trade School, the Mechanic Arts High School, and the co-operative courses in a number of the general high schools all give such opportunity. Elementary shopwork, therefore, while continuing to emphasize technique, should embrace a great variety of experiences.

EDWARD C. EMERSON,
Associate Director of Manual Arts.

PART I.—AIMS, MEANS AND MINIMUM REQUIREMENTS.

Aims.

I. To secure a vigorous, mental reaction through the pupil's mental activity and his interest in the constructive problem.

II. To develop a general industrial and vocational intelligence by stimulating an interest in those industries which are fundamental to civilization, and through the acquaintance with the particular industrial activities of the community.

III. To develop an ability to execute with a fair degree of skill a variety of tool manipulations in different materials.

IV. To develop such general sense of construction and adaptability of materials as will aid the pupil in solving many of those mechanical problems which he will encounter in his daily life, thus contributing to worthy home membership.

V. To develop interests and powers which will contribute to the worthy use of leisure.

VI. To develop discrimination in purchasing, and intelligence in using objects of everyday use.

Means.

I. A graded series of manipulative experiences drawn from woodworking, printing, bookbinding, machine shop practice, electrical work, sheet metal work, painting, and gardening.

II. Trips to manufacturing establishments and guided observation of building activities of industrial significance which may be in progress in the community.

III. The display of and frequent reference to instructive and illustrative material as follows:

Charts showing the evolution of tools in process of manufacture.

Books on tools and industry.

Pamphlets of information on concrete.

Specimens of the common woods.

Government bulletins pertaining to forestry, mining, bird life, industrial conditions, etc.

Catalogs of machines and tools.

Charts showing tools, screws, nails, hooks, and other hardware supplies and equipment.

Blueprints, drawings and photographs of interesting problems.

* Files of "Manual Training Magazine."

* Files of "Industrial Arts Magazine."

* Files of "American Forestry."

† Lantern slides on:

Manual Training in Boston.
Prevocational Work in Boston.
Lumbering.
Woodworking Processes.
Art Subjects.

Motion pictures of industrial processes given from time to time through the co-operation of different manufacturers.

IV. The undertaking of such construction and repairs as are within the ability of the pupil and are consistent with the principles of education. (See page 7, "Orders required.")

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* Available at the office of the department.

† The department will gladly arrange for lectures to Parents' Association, or loan slides for this or other purposes. It is earnestly desired that teachers give occasional illustrated talks to their pupils, using these slides or those from other sources.

PART II.— SUGGESTIONS ON AIMS, MATTER, AND METHODS.

Admission of Pupils to Shopwork.

Only pupils who have reached Grade VI., or who are twelve years of age or over, may be admitted to classes in shopwork.

Time Allotment.

Manual Training.

Two hours each week are allowed for this work, except in cases where a 90-minute period is necessary to meet the requirements of the intermediate school organization, or the demand of the elementary school program.

The suggested time allotment for manual training classes in intermediate schools is 90 minutes. This gives opportunity for two classes in the morning, instead of one as provided by the former 120-minute period. Additional time for intermediate manual training classes may be assigned from the allotment for optional subjects, thus allowing the 120-minute period if desired, or more time if the program permits.

Mechanic Arts Classes.

Fourteen periods (7 hours) are allowed in Grades VII. and VIII., and fifteen periods ($7\frac{1}{2}$ hours) in Grade IX.

Prevocational Classes.

Allotted time is two hours daily.

Courses Planned by Teachers.

Teachers are encouraged to originate courses of study, but should arrange their subject-matter in the manner suggested by the treatment in this syllabus (see pages 17 to 23, inclusive), giving special consideration to the first column in order that the several experiences shall be presented to the boy at such times in his development as to result in a vigorous mental reaction.

The plan of such a special course of problems must be available for inspection at any time, and a copy placed on file at the office of the Department of Manual Arts. Such courses should adequately cover the minimum requirements in the particular form of shopwork for which it is intended.

Lesson Planning.

Each lesson should be carefully planned and thought out as tc content before given, in order to secure interest and that a certain amount of ground may be covered. Teachers should keep an individual pupil record so that they may plan their work in advance.

Disposition of Product to City.

Each pupil may be called upon to work a reasonable amount of time (10 to 20 per cent) for the schools. The necessary omission from the stated course should be, in every case, that problem, regardless of position, which most nearly corresponds in exercises and difficulty to the work done for the schools. In cases of class work of this character, team work and industrial methods are recommended.

Orders Required.

The Schoolhouse Commissioners and the Business Agent have ruled that pupils should not do work affecting the structure of school buildings, or involving the use, aside from the prescribed course of study, of materials supplied by the city, except upon their respective orders placed through the Department of Manual Arts.

Placement of Work.

The department welcomes all opportunities for pupils in the different courses to do such productive work (not of an emergency or rush character) as is within their capacity and is of educational benefit. The pupils in prevocational classes may go outside their own districts to do such work.

Kinds of Work.

Work can be done in woodworking, printing, bookbinding, machine shop work, electricity, sheet metal, concrete, painting and lettering.

Charge for Work.

Work having the general character of supplies must be ordered on School Committee requisitions and will be charged against the principal's per capita allowance at a fair market price.

Work in the nature of furniture or of structural alterations must be ordered upon requisitions of the Schoolhouse Commissioners. In such cases the School Committee acts as a contractor in the employ of the Schoolhouse Commissioners and is paid for the work done at commercial rates.

Sending Requisitions.

In all cases where the department can be of service, a requisition made on the proper form and signed by the principal should be sent to the office of the department. If the work is to be done in the local shop, this requisition should be accompanied by the shop teacher's estimate of the price to be charged as described above. The requisition will be forwarded after approval and the addition of the price and the name of the school to which it is proposed to assign the work.

Following are sample requisitions:

A. On the Schoolhouse Commissioners (for furniture, shelves attached to walls of buildings, etc., or repairs to any school property of which the Schoolhouse Commissioners are custodians).

B. On the School Committee (for small articles other than furniture and not attached to any part of the school building).

A.

NOTICE.

ALL REQUESTS MUST BE MADE ON THESE FORMS. A SEPARATE FORM MUST BE USED FOR EACH KIND OF WORK.

BOSTON,.....192

To the SCHOOLHOUSE COMMISSIONERS:

I request that the following work be done:

Furnish one chestnut bookcase, size 3 feet 6 inches wide by 6 feet high by 10 inches deep, with 6 shelves (adjustable). Finish "Brown Oak."

.....

I recommend that this work be done by the Department of Manual Arts.

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Estimated cost,.....$.....
Contractor.....
.....

Chairman.

.....192 .....

School.....
(Signed).....

Principal.

Approved,
.....

Inspector.

B.

CITY OF BOSTON—SCHOOL COMMITTEE.

REQUISITION ORDER.

Approved * No.....

..... Date.....June,.....192.....

Laid out by.....*To Business Agent:*

Checked by..... *Please send the following to*.....*School*

Date Delivered.	Checked as Delivered.	Quantity.	Articles.	Charge to Account.	Charge to Sub-Div.	Price.	Amount.	
		3	Boxes for holding kindergarten materials.					
			I recommend that these be made by the Department of Manual Arts.					
			Do not write beyond this line.					
			Signed by the Principal of the School.					
	Signature of Principal.							

ORIGINAL. TO BE SENT TO THE BUSINESS AGENT.

* Teachers must not fill in this blank.

Home Mechanics and Material.

In so far as equipment will permit emphasis should be placed upon home repair work such as: Setting glass, soldering of utensils, making thresholds, repairing furniture, cane-seating, putting in window cords, placing new washers in faucets, etc.

Because of the very high cost of material, pupils may be encouraged, occasionally, to bring in from home such supplies as: Tin cans and boxes, boards from packing cases, etc. Caution should be exercised by the teacher, however, to see to it that such salvage material is obtained legitimately and not in excessive quantities.

Disposition of Product to Pupils.

When problems are worked out in materials furnished by the school the products are technically the property of the city, but regular, personal problems, executed during shop periods, may be given to the pupils, with permission of the principal, as follows:

One object each year, if desired by the pupil for a Christmas gift, may be given him immediately after completion.

Class sets of complete problems may be given when the next full set is completed, provided one or two specimens of each problem, and several examples of any work, required or original, correlating with drawing or other subjects, have been selected to be kept for one year.

Work for Individuals.

Work for other than school purposes may be done, but only in limited quantities, and must be charged at a full market price except in the case of pupils. (See below.)

Payments by Pupils.

For Materials.

The School Committee has ordered that "pupils be required to pay the cost of all materials used in making articles other than those termed the regular models." This is construed as meaning that if the pupil selects a problem which calls for materials disproportionate in amount or value, he should pay the difference between the price of such materials and those which he might reasonably be expected to use during the regular shop time. (Prices may be found on lists furnished, or upon application to the department office.)

For Broken or Lost Tools.

The shop equipment, as in the case of books, is "loaned to pupil," and if any part of it be "lost or damaged by carelessness or accident beyond what may be reasonably allowed . . . it is to be replaced by the pupil to whom it is loaned, and in the way required by the School Committee."

Mechanical Drawing.

One-fourth of shopwork time for year is to be given to mechanical drawing. This means one and one-half hours per month in classes taking one and one-half-hour periods of work, or two hours per month for classes taking two-hour periods of work, seven hours per month for classes taking seven hours of work, etc.

The aim of the instruction is to familiarize the pupil with the principles of orthographic projection, drawing conventions, dimensioning and the use of the drawing board, T-square and triangles, and should follow along practical lines in so far as possible.

Minimum Requirements in Drawing.

Processes.	Tools and Materials.	Knowledge.
1 Dr. Reading working drawings of simple objects.	.....	Blueprints.
2 Dr. (*a*) Pencil tracing. Transferring lines to wood. (*b*) Drawing on wood, metal or other material.	Tracing paper.....	Carbon paper.
3 Dr. Sketching the views necessary for the construction of an object of simple outline and dimensioning the sketch.	Drawing board, pencil, rule and eraser.	The three basic views and their relations.
4 Dr. Making instrumental working drawings of some of the objects made in the shop.	Drawing board, T square and triangles. Paper, thumb tacks, rule, pencil, eraser and compasses.	Such geometric problems as are applied.
5 Dr. Modifying contours of such subjects as the outlined work demands.	.....	Some principles of good form.
6 Dr. Making instrumental drawings of models not directly related to the course, but such as give further knowledge of principles of orthographic projection.	.....	Broken drawing. Sections. Auxiliary views. Drawing to scale.

Suggested Outline.

Sixth Grade. (Two Views.)

(*a.*) Top and front.

(*b.*) Front and side.

First half year,— squared paper, rule, triangle and compasses.

Second half year,— T-square, drawing board: drawings full size, broken drawings.

Seventh Grade.

Drawing board, T-square, triangles and compasses.

Simple two-view drawings followed by three-view drawings before end of year.

Scale drawings, full and half size. Sections.

Freehand sketches on squared paper always to precede the finished drawing.

Teacher to use freehand isometric or perspective sketches on board for illustrations.

Eighth Grade.

1. Freehand dimensioned sketches.
2. Complete instrumental drawing, 3 views.
3. Isometric drawing.
4. Assembly drawing of box or model of several pieces drawn to scale.
5. Sheet of geometrical problems.
6. Simple plan and elevation of small building.

NINTH GRADE.

Geometrical construction, orthographic projection, isometric drawing, developments, working drawings to scale, study of dimensioning.

Minimum Requirements in Manual Training.

Woodworking.

NOTE.— Numbers in parentheses refer to sections in Griffith's "Essentials of Woodworking."

The following statements represent the recommendations of the committees for the minimum shopwork requirements in ability and knowledge, to warrant a mark of "2" at the end of the eighth grade of the elementary school.

The requirements in knowledge include not only that information which comes to the boy through actual contact with materials, but also that given to him by the teacher through class talks.

The boy should know the names and prominent characteristics of the materials used. He should have a general knowledge of the sources and methods of producing these materials, including the processes involved in the manufacture of each, and in their preparation for shop use.

PROCESSES.	TOOLS AND MATERIALS.	KNOWLEDGE.
1. Measuring and laying off distances on wood. (1.) (10.)	Rule, pencil and knife.....	The common bench rule and its characteristics.
2. Making straight lines at right angles to reference faces. (2.)	Try square, pencil and knife.	The try-square and its parts. Condition of knife point necessary for good work.
3. Setting marking gauge to a definite dimension and gauging straight lines parallel to reference faces. (5.)	Marking gauge and rule....	The marking gauge and its parts. Condition of spur necessary for good work.
4. (*a*) Crosscut and rip sawing. (12–13.)	Crosscut and rip saws and sawhorses.	The characteristics of the common hand saws. (11.)
(*b*) Back sawing. (14.).....	Back saw and bench hook...	
5. Setting the common bench planes for general use and planing. (19–20.)	Jack plane.....	The names and characteristics of the common bench planes. The reasons for choice for specific work. Methods of sharpening. The cabinet scraper and its use. (63.)
(*a*) Planing edges straight and at right angles to one side, testing with try-square and straightedge. (21.)	Straightedge and try-square.	
(*b*) Planing to gauge lines for width. (29.)	Jack plane. (21.)	
(*c*) Block, planing ends to knife lines. (24.) (31.)	Block plane.	

	Processes.	Tools and Materials.	Knowledge.
	(*d*) Planing sides flat. (26.)	Jack and jointer planes. Straightedge and winding sticks.	
	(*e*) Planing sides to gauge line for thickness. (30.)	Jack and jointer planes and straightedge.	
6.	Driving and setting nails without splitting. (65–68.)	Hammer, nails and nail set.	The names and characteristics of the common kinds of nails.
7.	Boring. (36–43)	Bit brace and auger bit....	The names and characteristics of the common wood boring tools.
	(*a*) Perpendicularly to a given surface through stock. (44.)		
	(*b*) Perpendicularly to a given surface to a given depth. (45.)		
8.	Boring for and driving screws. (39–40.) (71–72.)	German or drill bits, countersink and screw driver. (70.)	The names and characteristics of the common wood screws. Choice of bit.
9.	Chiselling and gouging		The names and characteristics of the common bench chisels and gouges.
	(*a*) Chiselling to pencil guide lines in modifying contours. (49.)	Firmer chisels.	
	(*b*) Chiselling to gauge and knife lines.		
	(*c*) Gouging recesses to fit a template. (51.)	Firmer gouges.	
10.	Sandpapering. (60.) (64.)	Sandpaper and sandpaper blocks.	Sandpaper, its manufacture and grading. Its proper use.
	(*a*) Sandpapering flat surfaces.		
	(*b*) Sandpapering curved surfaces.		
11.	Preparing work for gluing. Gluing work and applying hand screws and clamps in proper manner. (73–75.)	Cold glue, hand screws, cabinet clamps.	Glue, its sources and commercial forms. Hand screws, clamps and their parts.
12.	(*a*) Marking on wood from template.	Wood or paper template and pencil.	Various methods of getting curved line on wood.
	(*b*) Plotting curves on wood.	Compasses, rule, pencil and try square.	Various methods of cutting to curved lines.
	(*c*) Curve sawing. (15.)	Hand-turning saw.	
	(*d*) Spokeshaving. (59)	Spokeshave.	
13.	(*a*) Making a square butt joint.	Such of above tools as work demands.	Appearance and use of halved, tongue and groove, housed, rabbeted, mortise and tenon, mitered, dowelled and open dovetail joints. (76–100.)
	(*b*) Making an edge to edge joint. (83–84.)	Jointer plane. (23.) Try-square and straightedge. Cold glue.	
14.	Finishing	Brushes, oil, stains and wax.	Effect of oil, stain, shellac and wax on surface of wood. Methods of application.
	(*a*) Oiling.		
	(*b*) Staining.		
	(*c*) Waxing.		

Direction Sheets.

At the discretion of the teacher the "Typical Directions" for any problem in the suggestive seventh or eighth grade course may be copied on the blackboard, or duplicated and used as direction sheets in the place of some of the verbal instruction.

Accessories and Finishes.

Teachers of shopwork are to use their discretion in the distribution of limited quantities of hooks, screw eyes, canvas, shellac, stain, etc., sent to the work.

Sandpaper.

Sandpaper is a finishing tool and should be used only after all work with edged tools has been completed.

In sandpapering flat surfaces use a sandpaper block and work in the direction of the grain.

In sandpapering end grain use the sandpaper block.

In sandpapering concave surfaces use a rounded edge of a sandpaper block, a dowel, tool handle or other object with a curved surface.

Use sandpaper without the block only on curved or shellacked surfaces.

Blackboard Erasers.

The blackboard erasers made in the school shops may be disposed of in either of the following ways:

1. Where the erasers are needed in the district, the manual training teacher should inform the principal of the number of erasers available and receive from him a receipted requisition on the School Committee for this number. This requisition should then be sent to the office of the department. The erasers may then be put into use in the district in which they were made. This procedure will stimulate the boys' interest in the problem as they will see their particular work actually fulfilling a school need.

2. Where the erasers are not needed in the district the manual training teacher should bundle them and address the package thus: "Supply Rooms.....erasers for stock from the..... School" (number of erasers and name of school to be stated). Leave the package where the driver of the school team can get it. The department should be informed of the number of erasers thus available for stock in order that the proper credit memorandum may be made out and sent to the Supply Rooms.

Authorized List of Problems.

Bench cradle (*19-B.*).
Bench hook.
Bird houses and feed trays.
Blackboard eraser (*21-A.*).
Blotter with knob (*16*).
Book case.
Book rack.
Book rack blank, hinged.
Book rack blank, housed.
Book rack blank, mortised.
Book supports (*23*).
Box blanks (*10*).
Bread and cookie cooler.
Broom holder (*3–D.*).
Butterball paddle (*5–B.*).
Calendar stand.
Card holder blank (*6–C.*).
Cart.
Chair.
Clothesline winder (*2–E.*).
Coat hanger (*16–A.*).
Coat and trousers hanger (*35*).
Corner bracket.
Cover handle (*1–D.*).
Desk.
Desk flag holder.
Dish drainer.
Door weight, concrete (*25*).
Dough board.
Drawing board (*13–A. and B.*).
Elliptical bread board (*17*).
File handle.
Flat ruler (*6–D.*).
Flower pin.
Flower pot (concrete).
Flower pot stand.
Flower stick.
Footstool, reed top.
Footstool, slat top (*8*).
Footstool, solid top.
Fork (*2–D.*).
Half lap joint.
Half lap miter joint.
Hammer handle
Hatchet handle.
Hook strip.
Inkstand (*26*).
Inkstand and tray (*7–A.*).
Jardiniere stand.
Key rack, carved.
Key rack, plain (*5–C.*).
Kitchen rack (*11*).
Kitchen rack (revolving) (*38*).
Kite string winder (*1–B.*).
Knife polishing board.
Lamp.
Lap writing board (*20*).
Laundry stick (*1–C.*).
Letter box.
Letter holder (*6–A.*).
Letter opener.
Letter opener (*4–C.*).
Loom, small.
Mallet (*21–B.*).
Matchbox holder.
Medicine cabinet.
Mixing spoon (*15 B.*).
Nail box.
Necktie holder (*37*).
Needle (*2–B.*).
Nozzle holder.
Order board (*3–A.*).
Ottoman (*9*).
Paper cutter.
Paper knife (*7–B.*).
Pedestal.
Pencil holder (*36*).
Penholder.
Pen tray (*14–C.*).
Pen tray with calendar holder.
Picture frame.
Picture frame (cigar boxes).

Plant stand (*22*).
Rolling pin (*3–A.*).
Round bread board.
Round ruler.
Sandpaper blocks (*1–A.*).
Scoop (*6–B.*).
Shelf blank, horizontal (*14–A.*).
Shelf blank, vertical (*14–B.*).
Shelf (fixed contour).
Shoe polisher (*19–B.*).
Shrub label.
Sink scraper.
Skewer (*2–A.*).
Sleeve board (*24*).
Sleeve board with base (*4–A.*).
Solitaire board.
Spoon (*4–B.*).
Stationery holder (*39*).
Step ladder.
Strop (*7–C.*).
Swing board (*3–B.*).
Table.
Taboret (round).
Taboret (square).
Teapot stand.
Tie rack (*18*).
Tool rack.
Towel holder (*40–A.*).
Towel rack.
Towel roller.
Toy, dog (*12*).
Toy, topsy turvy.
Toy, tumbler man.
Trellis.
T square (*13–C.*).
Twine holder.
Ventilator (*2–F.*).
Vise handle.
Wall pocket.
Wedge.
Whisk broom holder.
Winding sticks (*2–C.*).

SIXTH GRADE.

The purpose of shopwork in this grade is to introduce the common woodworking tools by means of problems of simple construction and to give some knowledge of the underlying principles of mechanics.

Although pupils should be induced to use tools freely, careful attention should be given to a correct technique, that good habits of manipulation may be formed.

The problems are such as encourage freedom of action.

Some opportunity is furnished for practical application of constructive and decorative design.

To Square to Dimensions When Wood is of the Desired Thickness.

(See Direction Sheet "A.")

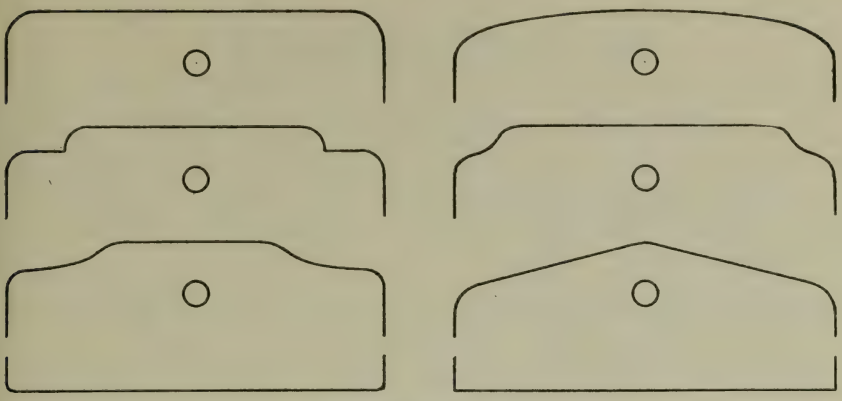
Suggestive Course.

Experiences. (Note.— Numbers refer to Minimum Requirements. "Dr." indicates Drawing.)	Illustrative Suggestive Problems. (Note.— The number following the name of the wood indicates the number of feet required for 10 boys.)	Typical Directions.
1. 1 Dr., 1, 2, 3, 4*a*, 4*b*, 5*a*, 5*b* and 7*a*.	Sandpaper block (*1-A.*), ¾-inch white pine (*2.3*). ("Our Native Trees," page 443.) Class Options.— Match scratcher. Base for toy.	Make two blocks. Get out stock long enough for both and plane in one piece. Square to dimensions. (Omit block planing.) Locate hole and bore vertically.
2. 1 Dr., 1, 2, 3, 4, 5*a*, 5*b*, 7*a* and 10*a*.	Clothes-line reel (*39*), ¾-inch whitewood (*3.33*). Class Options.— Garden marker, nozzle holder, string winder.	Get out stock wide enough for two side pieces. Square to dimensions 1 and 2 on both sides. Gauge width from each side, Saw between gauge lines. Plane to gauge lines on each piece. Square ends and cut to length. Lay off centers. Bore holes for dowels. Mark out slanting surfaces at ends and plane. Finish with sandpaper. Cut dowels to required lengths. Fit and nail in place.
3. 1 Dr., point whittling and 10*b*.	Sharpening pencil. Individual Options.— Propeller.	Whittle away from body, with a shearing cut. Note.— After this lesson the boys should be held responsible for the condition of the pencils.

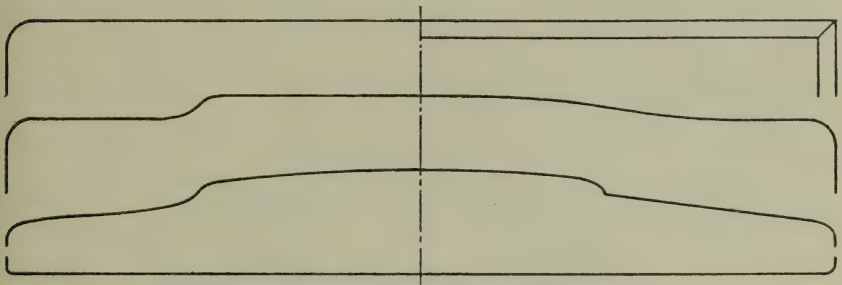
Experiences. (Note.— Numbers refer to Minimum Requirements. "Dr." indicates Drawing.)	Illustrative Suggestive Problems. (Note.— The number following the name of the wood indicates the number of feet required for 10 boys.)	Typical Directions.
4. 1 Dr. and drawing of semi-circle, 4*a*, 5*a*, 12*b*, 12*c*, 12*d* and 10.	Bread board (semi-circular ends or rounded corners), ½-inch white pine (*30–B.*) (*6.41*). Individual Option.— Bread board (elliptical) hard wood. Hockey puck.	Get out stock. Square to dimensions 1 and 2. With gauge locate near ends center line on marked side parallel to marked edge. Draw center line with pencil. Draw semi-circles on center line. Curve saw ⅛-inch outside of line. Spokeshave to line. Test for squareness. Gauge pencil lines for guide in cutting molding on edge. Spokeshave bevels. Spokeshave to curve. Sandpaper.
5. 2 Dr., 1, 2, 3, 4*b*, 5*a*, 5*b*, 5*c*, 6, 7*a*, 7*b*, 8, 9*a*, 9*b*, 10, 12*c*.	Toys.— ⅛-inch and ½-inch country pine (*5*).	
6. 1 and 4 Dr., 1, 2, 3, 4*a*, 4*b*, 5*a*, 5*c*, 5*b*, 12*a*, 12*c*, 9*a*, 10*a*, 10*b* and 6.	Plant stand (*22*), ½-inch chestnut (*5*), ⅛-inch chestnut (*1.25*) ("Our Native Trees," page 386) or whitewood. Class Option.— Footstool (*5*), ½-inch chestnut (*12*) and ⅛-inch chestnut (*7.5*). Individual Option.— Dish-pan rest. Footstool. Solid top.	Get out stock (for slats, have stock wide enough for at least two slats). Slats.— Square to dimensions, 1, 2, 4, 5. Gauge width of slat from marked edge. Gauge width of slat plus ¼ inch to allow for sawing. Saw between gauge lines. Plane to lines, mark new reference ‖, and repeat process. Supports.— Use same processes for slats in squaring to dimensions. Locate centers of arcs in forming feet. Holding both pieces together in vise, bore holes. Gauge lines tangent to holes. Saw with turning saw and chisel to lines. Sandpaper all surfaces except those which form joints in finished stand. Nail outside slats. Space inside slats and nail. Set nails. Sandpaper top.
7. 4 Dr. and 5 Dr., 1, 2, 3, 4, 5*a*, 5*b*, 5*c*, 12*a*, 12*c*, 12*d*, 7*a* and 10.	Bill holder (*31*) ⅜-inch whitewood (*2.5*). Option.— Newspaper holder (*3–A.*). Supplementary.— Memorandum pad holder. Calendar back. Flat toy. Shelf.	Make drawing of blank. Get out stock. Square to dimensions 1–3. Design contour of top. Make three trials, choose the best and cut out for template. Apply template to wood. Curve saw. Spokeshave or whittle to line. Bore hole horizontally. Square to dimensions 5. Sandpaper. Fasten to clip.*
8.....	Larger Toys.— Pupils supply material; packing boxes, etc.	Require definite dimensions and a wholesome respect for correct technique. Encourage good habits of workmanship.

* To be furnished by pupil, if he so desires.

The Department of Manual Arts has on file "Siepert's Shop Problems," Series 1 to 7 inclusive, from which selection may be made. Blueprints may be made to order as requested. It is suggested that teachers examine these sheets in the office of the department, and order those which are adaptable to their problems.

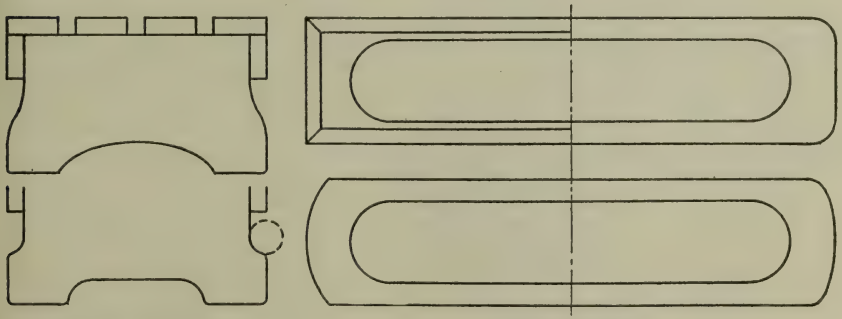


ORDER BOARD



TIE RACK AND KEY RACK

LETTER HOLDER



FOOT STOOL

PEN TRAY

SEVENTH GRADE.*

The purpose of shopwork in this grade is to provide for somewhat technical instruction in the execution of problems in advance of those of the previous year, including some actual work in materials other than wood. Further opportunity is given for the application of constructive and decorative design.

To Square to Dimensions When Wood is Not of the Desired Thickness.

(See Direction Sheet "B.")

Suggestive Course.

Experiences. (Note.— Numbers refer to Minimum Requirements. "Dr." indicates Drawing.)	Illustrative Suggestive Problems. (Note.— The number following the name of the wood indicates the number of feet required for 10 boys.)	Typical Directions. (Note.— "Ins." indicates inspection by the teacher.)
1. 1, 2, 3, 4 and 5 Dr., 1,2,3, 4, 5, 9*a*, 10, 14.	Key rack (*5–C.*), $\frac{5}{8}$-inch rough gum, butternut or mahogany (*4.8*). ("Our Native Trees," pages 160 and 274.) Class Option.— Garment holder (*32–A.*), $\frac{5}{8}$-inch rough gum, butternut or mahogany (*2.06*). Supplementary.— Trellis.	Make dimensioned sketch. (Ins.) From sketch, guided by sheet *5-C.*, make complete working drawing, one-half scale. (Ins.) Get out stock. Square to dimensions 1. (Ins.) (Use of winding sticks.) Square to dimensions 2, 3, 4 and 5 (Ins.), 6 (Ins.). Show on drawing slight modification of contour, or other features of decoration, such as bevelled or rounded arrises. Locate position of hooks. Mark guide lines for feature of design. (Ins.) Cut to guide lines. (Ins.) Sandpaper. (Ins.) Finish with oil, wax or both. (Ins.) Put in hooks.
2. 3 and 4 Dr., 1, 2, 3, 4, 5, 7*a*, 8, 9*a*, 9*b*, 10.	Kitchen rack (*11*), $\frac{9}{16}$-inch whitewood (*5.2*), $\frac{1}{2}$-inch whitewood (*4.6*). Note.— Back to be $\frac{1}{2}$-inch thick. Class Option.— Tool rack. Broom holder.	Make dimensioned sketch at home to meet individual needs. (Ins.) From sketch (guided by woodworking sheet 11) make working drawing, full size. (Ins.) Get out stock. Square to dimensions 1–6. (Ins.) Lay out channels, first in fine pencil lines (Ins.), then in knife and gauge lines. Saw and chisel channels. (Ins.) Locate holes on top side. Mark slots with knife lines. (Ins.) Bore holes and cut slots. (Ins.) Lay out corners on both sides and chisel to lines, cutting vertically on a waste piece of stock. (Ins.) Locate screws, bore and countersink. Sandpaper. (Ins.) Assemble. (Ins.)
3. 1 Dr., 1, 2, 3, 4, 5, 8, 9*a*, 10, 12*b*, 12*c*, 12*d*.	Sleeve board (*24*), $\frac{7}{8}$-inch whitewood (*21*), $1\frac{1}{8}$-inch whitewood (*4.2*). Class Option.— Shoe polisher (*19–A.*) (*4.8*). Blotter with knob (*16–A.*), $\frac{1}{4}$-inch sweet gum (*1.8*), $\frac{7}{8}$-inch sweet gum (*2.2*).	Top.—Plane two broad surfaces only, obtaining proper thickness. (Ins.) Draw pencil center line lengthwise on first side, locate centers and draw arcs for each end, connecting points of tangency with pencil lines. (Ins.) Rough out ends with turning saw and spokeshave to line. (Ins.) Draw pencil guide lines for rounded edge. (Ins.) Bevel and finish edges to required shape. Lay out, bore and countersink screw holes. Take cleaning shaving off broad surfaces and finish with sandpaper. (Ins.)

* Woodworking with printing, cobbling, cement work, chair seating and other incidental activities as equipment is furnished.

Experiences. (Note.— Numbers refer to Minimum Requirements. "Dr." indicates Drawing.)	Illustrative Suggestive Problems. (Note.— The number following the name of the wood indicates the number of feet required for 10 boys.)	Typical Directions. (Note.— "Ins." indicates inspection by the teacher.)
3.....	.....	Base.— Square to dimensions 1–6. Gauge pencil guide lines for chamfer. With block or smooth plane, plane chamfer on ends. (Ins.) Plane chamfer on edges. (Ins.) Bracket.— Square to dimensions (Directions A) 1–4. Lay out curve on wood. (Ins.) Saw close to line. Chisel and file to line. (Ins.) Bore and countersink for screws. Take cleaning shaving with smooth plane. Sandpaper all parts except those surfaces which form joints. Assemble. (Ins.)
4. 1 Dr., 1, 2, 3, 4, 5*a*, 5*b*, 10.	Dibble (*32–B.*), ⅞-inch hickory or ¾-inch maple (*1.5*). ("Our Native Trees," pages 276–295.) Note.— May be made from old broom handle or shovel handle, 1 inch to 1¼ inches in diameter. Class Options.— Rolling pin (*3–A.*), 2¼-inch by 2½-inch maple (*20* r. ft.), and mallet (*21–B.*), ⅞-inch maple (*1.2*), 2¼-inch by 2½-inch maple (*6 r. ft.*) Jump rope handles, ring toss, pointer.	Get out stock. Square to dimensions 1–6 (omitting block planing.) (Ins.) On one side of square piece square two lines which, with the arrises, will form a square. (Ins.) Draw the diagonals. Lay off with knife point one-half the diagonal on the edge of a piece of paper. From each arris lay this distance off on one of the squared lines. (Ins.) Set gauge and gauge light guide lines for the octagonal prism. (Ins.) Plane to lines, holding piece in bench cradle. Remove corners to form sixteen-sided prism, thirty-two, etc. (Ins.) Mark out length of point. Chisel and plane point, first to square. (Ins.) Finish round end. (Ins.) Sandpaper. (Ins.)
Home Mechanics.....	Repairing of household furniture and utensils. Concrete work. Form to be made of ½-inch country pine (*11*): Teapot stand, flower pot, teapot tile with wood base. Stepping stone. Individual Project.— Pupils supplying material: Packing boxes, or other salvaged material.	

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EIGHTH GRADE.*†

The shopwork of this grade should make demands on the pupils for some originality and initiative in selecting and planning for the execution of problems involving somewhat exacting tool manipulation. Special emphasis is laid on joinery and the principles of construction.

From the problems suggested selections may be made from each group. These may be presented to the class as a whole, or different problems from one group (beyond the second) may be given to different boys in the class according to their abilities. After the completion of the first two problems, individual options may be allowed in cases where pupils have sufficient patience, strength and skill to produce substantial, attractive and well-finished pieces of furniture without disproportionate demands on the instructor.

To Square to Dimensions. (Same as Grade VII.)

Suggestive Course.

Experiences. (Note.—Numbers refer to Minimum Requirements. "Dr." indicates Drawing.)	Illustrative Suggestive Problems. (Note.—The number following the name of the wood indicates the number of feet required for 10 boys.)	Typical Directions. (Note.—"Ins." indicates inspection by the teacher.)
1. 1 Dr., 1, 2, 3, 4, 5, 9*b*, 9*e*, 10.	Blackboard eraser (*21–A.*). 1-inch rough whitewood (*1.6*).	Get out stock. Square to dimensions. Mark out rabbet. (Gauge and knife lines.) (Ins.) Saw and chisel rabbet on ends. Score out rabbet on edges (chisel and mallet) and finish with chisel. Mark in pencil groove on edges, and gouge to lines. (Ins.) Make template for groove in top and mark on ends. Mark guide lines in pencil. (Ins.) Gouge to lines and to fit template. (Ins.) Round corners with block or smooth plane. (Ins.) Sandpaper. Cut carpet to size and tack it on. (Ins.)
2. 1 Dr., 1, 2, 3, 4, 5, 7, 8, 10*a*, 11, 13*b*.	Drawing board and T-square (*15*), ¾-inch white pine (*19.2*), ¼-inch maple (*3.2*), ½-inch maple (*2*). Class Option.— Checker board. Score and stain squares. Winding sticks, ⅜-inch rough butternut and ¾-inch white pine (*10.8*). Lap writing board, ¾-inch white pine and ¼-inch sweet gum (*14.7*). Tray. Dough board.	Get out stock in three pieces. Square to dimensions 1. Indicate with arrow the direction of grain on each piece. Observe grain and annual rings and plane edges to form joints. (Ins.) Glue. (Ins.) Remove glue. Square to dimensions 1–6. Get out stock for cleats. Bottom cleats: Square to dimension (1–5, Directions A.) Chamfer corners. Locate holes and bore. (Ins.) Attach to board. End cleats: Square to dimensions 1, 2, 3, 5, 6. Locate holes. Bore and cut slots. Attach to board. Square to dimensions 4. Sandpaper. (Ins.) T-square. Square to dimensions 1–5 (Directions A). Locate and bore hole in place. (Ins.) Locate, drill and countersink holes for screws. Mark and cut corners of head. Sandpaper sides of blade and all but inside edge of head. (Ins.) Locate blade on head and with aid of bradawl drive one screw. Square blade with head and drive remaining screws. (Ins.) Note.—T-squares well made should be shellacked.

* See footnote under Seventh Grade.

† Problems may be omitted to give time for the making of articles needed in the school or ordered by the department.

Experiences. (Note.—Numbers refer to Minimum Requirements. "Dr." indicates Drawing.)	Illustrative Suggestive Problems. (Note.—The number following the name of the wood indicates the number of feet required for 10 boys.)	Typical Directions. (Note.—"Ins." indicates inspection by the teacher.)
3. 1, 3 and 4 Dr., 1, 2, 3, 4, 5, 7, 8, 9*b*, 10, 11.	A Bench hook (*53*), 1¾-inch oak; (*2.5*), ½-inch oak. (*6.4*). Lamp for gas or electricity.	Make instrumental working drawing from dimensioned sketch. Get out stock for board. Square to dimensions 1, 2, 3, 5, 6. Plane thin shaving off each wide surface. (Ins.) Lay out centers for screw holes, bore and countersink. Lay off centers for auger bit hole and bore. Get out stock long enough for two end pieces. Square to dimensions 1, 2, 3, 4, 5, 6, while in one strip. (Ins.) Sandpaper. (Ins.) Assemble pieces. Mark screw centers on end blocks. Punch or bore small hole. Put on thin coat of cold glue. Fasten with 1¼-inch No. 8 screws. (Ins.) Mark out bevels. Cut with 1-inch chisel. (Ins.) Sandpaper. (Ins.)
4.	Diploma or Picture Frame.—¼-inch whitewood, (*22.*) (Note.—Make size of frame to conform to size of diploma or picture.) Step-ladder. Table. Stool, with woven top. Pedestal.	Get out stock in one piece; long enough for one short strip and one long strip, and wide enough for two. Square to dimensions 2. On both sides gauge width from each side. (Ins.) Before separating pieces mark out rabbet. Cut rabbet, using gauge. knife and chisel. (Ins.) Separate pieces. Finish squaring to dimensions (Ins.) Mark out half lap joints for corners, being sure that side pieces overlap top and bottom on front sides. (Ins.) Face off pieces. Bore and counter bore for ⅜-inch screw through back lap. (Ins.) Fasten together with cold glue. Sandpaper. (Ins.)
5. 1, 3 and 4 Dr., 1, 2, 3, 4, 5, 6, 8, 9*b*, 10, 11, 13*a*, 14.	Covered box (*10*), ¾-inch whitewood or ½-inch sweet gum (*24.*) Individual Option.—Knife box, window box, shoe polishing box, concrete form for flower pot, match box holder, stationery box, feed and suet box. Medicine cabinet. Cart.	Design box. Make working drawing. Get out stock in one piece; long enough for one short strip and one long strip and wide enough for two. Square to dimensions 1, 2, 4, 5. Square other end. Lay off length of sides from one end and length of ends from other end. (Rule 6.) Gauge width * of frame pieces on each piece. Gauge width of frame plus $\frac{1}{16}$ inch and saw between lines. Plane to lines. (Rule 3.) (Ins.) Get out stock for top and bottom. For flush top and bottom: Square to dimensions 1, 2, 4 and 5. Saw top and bottom pieces $\frac{1}{16}$ inch longer and $\frac{1}{16}$ inch wider than frame of box. Clean and sandpaper inside surfaces. Glue and nail frame pieces. (Ins.) Plane bottom edges of frame to fit bottom piece. Glue, nail (or both) bottom piece onto frame with squared end and marked edge flush with end and side of frame, respectively. Treat top in same manner if box is to be sawn apart. (Ins.) Plane projecting ends and edges off flush with ends and sides of box. Gauge from top of body for height, and height of cover. (Ins.) Saw between gauge lines and plane to lines. (Ins.) Fit hinges and lock, or catch. (Ins.) Remove fittings. Sandpaper and apply finish. (Ins.) Put back fittings. (Ins.) Note.—Where the conditions differ from the above the method of procedure should be determined by the instructor.
6. 4 and 5 Dr., 1, 2, 3, 4, 5, 7*b*, 9*a*, 9*b*, 10, 11, 14. Making rabbeted joint and doweling.	Book supports (*23*), ¼-inch gum (*6.2*) and ½-inch gum (*6.2*).	
Co-operative Projects:	Red Cross work.	

* If the cover is to be made by sawing the box apart, make width ⅛ inch greater than the inside height of box.

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NINTH GRADE.*

Owing to the varying conditions in the different elementary schools the shopwork for ninth grade boys need not be uniform throughout the city. Where possible, work in shops equipped for some other activity than woodwork should be given. Where only the woodworking shop is available the shopwork may include the following:

Suggestive Course:

1. Bead loom, candlestick, axe handle (to fit axe or hatchet).
2. Bedside table, buck saw or turning saw frame, Red Cross chair, sawhorse, shelf and towel rack, window screens.
3. Electric lamp table, Red Cross table, telephone table and seat, umbrella stand, woven reed seat.
4. Checker board (glued-together strips of light and dark wood), clock case, jewelry case, magazine stand, picture frame (half-lap miter), stationery holder, step ladder, ironing board with folding standards.
5. Serving tray (inlaid), tool chest.
6. Supplementary — Joints (construction and use), home repair work, tool sharpening.

(a) Problems closely related to the needs of the time, such as making evaporators for the preservation of fruits and vegetables.

(b) Work for the school, requisitioned for by the master or ordered for stock, such as kindergarten boxes, bulletin boards, jumping standards, blackboard rules, etc., and repair work.

(c) Concrete work, including the making of wooden mold for flower pot, window box, bird bath or other suitable problem.

(d) The making of jigs to assist in quantity production of articles, such as erasers, kindergarten boxes, concrete forms, etc.

(e) Problems where boys work in groups somewhat according to industrial methods in which subdivision of labor is an important feature.

NOTE.— When working out "b" the methods suggested in "d" and "e" may be followed.

* Teachers having ninth grade work should confer with the department relative to a course of study that will meet the local conditions.

MINIMUM REQUIREMENTS FOR SHOPWORK IN INTERMEDIATE SCHOOLS, INCLUDING PREVOCATIONAL AND MECHANIC ARTS COURSES.

Courses.

Shopwork courses in intermediate schools are conducted as "try-out" courses. As far as variety of shops permit, the classes of the seventh and eighth grades rotate through the shops, changing the activity in September and in February. It is desired that each pupil have at least one-half year's experience in each of three or four different basic activities. (See page 7. "Kinds of Work.")

The pupils of Grade IX. may choose a shop activity for an entire year's work.

There are three distinct shop courses in the intermediate organization:

Manual Training.
Mechanic Arts. (See Document No. 15 — 1919.)
Prevocational.
(See page 6 for time allotments.)

Aims.

Manual Training.— See page 4.

Mechanic Arts.— See page 4.

Prevocational.— In addition to those on page 4 prevocational shopwork has a specific aim as follows:

To make evident to boys the value of book knowledge through shop activities correlated with academic subjects, creating a desire for further study and for a continuance of school training.

Minimum Requirements in Bookbinding.

Processes.	Tools and Materials.	Knowledge.
1. Getting out stock.....	Book cutter, fancy, plain or ruled paper.	Kinds of paper. Weights. Sizes. Grain of paper. Kind for job. Figuring stock to advantage.
2. Counting.....	Pointed stock knife.....	Correct method of fanning out stock. Keeping stock clean while fanning out and counting. Use of pointed stock knife. Counting.
3. Folding.....	Bone folder, paper stock....	Fanning out. Position of hands. Use of folder; hand folder; machine folder.
4. Dry pressing.....	Bar press, press boards.....	Reason for dry pressing. Dividing book for building in. Method of building into press.

	Processes.	Tools and Materials.	Knowledge.
5.	Sawing	Finisher's press, hacksaw	Jogging. Reason for sawing. Depth of saw marks. Kettle stitch. Sawing for tape or string.
6.	Marking for stabbing	Steel rule, pencil	Use of rule.
7.	Stabbing	Stabbing board, awl, hammer	Use of awl. Use of hammer. Reason for choice of stabbing method.
8.	Stab stitching	Awl, hammer, needle, thread	Type of job demanding stab or wire stitching. Method of sewing.
9.	Sewing on tape	Tape, sewing frame, needle, thread.	Type of job to be sewed on tape. Setting up frame for sewing on tape. Method of sewing.
10.	Sewing on cord	Sewing frame, linen thread, needle, strand cord.	Cord for bands — how made. Thread — how made. Value of linen or cotton thread. Kind suitable for each job.
11.	Whip stitching		Method of whip stitching. Type of job demanding it. Reason.
12.	Hammering book	Book cutter, hammer	Reason for hammering; jogging book; clamping in cutter; pulling out slack.
13.	Tipping down end pages and end signatures.	Paste or glue, protection sheets.	What a started signature means. Reason for tipping. Width of tipping. Folding for protection sheet.
14.	Getting out end papers	Paper stock, book cutter, knife, rule, pencil.	Knowledge of rule. Figuring stock to advantage. Fancy or plain end papers. Kind suitable for job.
15.	Folding and making end papers.	Bone folder, vellum for joint, marbled, cloud or plain paper, glue, glue brush.	Type of end paper for heavy blank book; for fancy extra job; for commercial or library binding.
16.	Tipping or sewing on end papers.	Folder, protection sheets, glue or paste.	Use of end sheet. Fanning out end papers for tipping. Method of tipping on for leather joint.
17.	Trimming end papers	Shears	Reason for trimming. Method of trimming top and bottoms. Method of trimming fronts.
18.	Putting on fancy paper	Fancy paper, glue, glue brush, bone folder.	Method of gluing. Use of fancy paper.
19.	Cutting (or trimming) book	Book cutter, rule, cutting pad.	Action of cutter. Parts of cutter. Bleeding (print maps or plates). Setting gauges. Taking up swelling. Use of cutting pad. Following rub-offs. Method of sharpening knife.
20.	Sprinkling edges	Black or red sprinkle, sprinkle screen, brush.	Piling books for sprinkling edges. Mixing sprinkle. Reason for its use. Method of using on calf or sheep bindings.
21.	Gluing	Glue, glue brush	Consistency of glue for job. Kinds of glue — how made. Uses of each kind. Correct method of applying.
22.	Rounding back	Glue, glue brush	Piling books for gluing. Jogging into shape. Reason for gluing. Consistency of glue. Handling glue brush.
23.	Backing	Backer press, hammer	Taking up swelling. Size of joint. Weight of board to be used.
24.	Getting out boards	Board shears, pencil, rule	Knowledge of cardboard. Grain of cardboard. Weights. Proper kind of job.

Processes.	Tools and Materials.	Knowledge.
25. Making headband.....	Paste, print cloth, string....	Cutting cloth. Pasting cloth. Folding over string.
26. Putting on headband.....	Glue, glue brush, headband stock.	Kinds of headband. Method of sewing on silk headband for extra work.
27. Lining back.....	Glue, glue brush. Cartridge or tar paper. Lining-up folder.	Consistency of glue. Length of lining strip.
28. Tipping on boards.....	Cardboard, glue or paste...	Proper squares. Distance of board from joint according to size of book.
29. Getting out covering material.	Rule, shears, stock knife, buckram, vellum, canvas, morocco, calf, sheep, buffings.	Buckram, vellum canvas, how made? How bought? How they differ from each other. Kind best suited for job.
30. Skiving corners.....	Paring stone, skiving knife..	Skiving corners and reason for same. Use of paring stone and skiving knife.
31. Padding out corners.....	Buffing corners, padding, glue, glue brush, press.	Methods of padding corners and reason for same. Thickness of padding. Method of beveling edges.
32. Binding edges.....	Vellum, bone folder, glue, glue brush.	
33. Rounding corners.....	Round corner machine.....	Construction and use of round corner machine. Method of rounding corners. Use of gouge.
34. Casing-in or covering-in.....	Casing-in folder, shears, glue, glue brush.	Cutting and turning in corners properly. Consistency of glue. Proper room temperature. Use and position of loose back strip. Turning. Use of casing-in folder.
35. Covering book $\frac{1}{2}$, $\frac{3}{4}$, full bound.	Covering folder, band nippers, band sticks, head sticks, paste, paste brush, Morocco, calf, Russia, sheep.	Knowledge of leathers; kinds; how bought.
36. Marking for eyelets.....	Marking gauge.....	Method of laying out eyelets and need for same on job. Relation of eyelet setting in cover and punched paper. Construction of marking gauge.
37. Punching.....	Punch, eyelet machine.....	Method of punching. Construction and use of eyelet machine.
38. Measuring for scoring.....	Steel rule, scoring knife, newsboard.	Method of scoring and figuring size of bottom and cover layouts before scoring and dimensions for same. Weights of board necessary and kinds to be used (junk, straw or newsboard). Grain of stock. Accuracy in measuring.
39. Scoring.....	.....	Method of scoring. Use of knife and straight edge. Depth of scoring and need of same.
40. Cutting out corners.....	.....	Method of cutting corners. Use and position of knife, chisel and hammer on heavy board. Need of clean cuts and of removing corners.
41. Putting on binders.....	Cartridge paper, bone folder, glue, glue brush.	Kind of paper required, and difference between that and other types. Testing adhesive properties of glue. Method of applying binders to layout. Figuring amount of cartridge paper required and cost per box.

Processes.	Tools and Materials.	Knowledge.
42. Applying cloth or paper strips.	Fancy paper, vellum, vellum de Luxe, book cloth, bone folder, glue, glue brush, paste, paste brush, straight edge.	Necessity for cloth or paper on box and method of applying same. Use of folder on turning-ins. Use of shears and accurate cutting of corners. Grain of cloth or paper.
43. Pulling book apart.....	Knife.....	Folding for signatures. Number of folios to signature. Signature numbering or lettering. Inserts. Tipping in. Folding maps.
44. Putting into press.....	Bar press, edged boards....	Matching up books. Method of building into press. Setting grooves.
45. Pasting up book.....	Paste, paste brush.....	Setting squares. Pasting one or two sheets on. Kinds of paste. Uses of each kind. Right consistency for job on hand. How manufactured.
46. Getting out super cloth.....	Super cloth.....	Knowledge of rule. Square measure. Figuring to advantage. Super — how and where made? Why open weave? Method of applying.

Minimum Requirements in Electricity.

The customary detailed lessons will be preceded by general consideration and discussion of the following topics:

The electrician and requirements of the electrical trade.

Electricity. Its history and present day uses.

Magnetism. History: Molecular Theory, natural magnets, artificial magnets and electro magnets with experiments.

Processes.	Tools and Materials.	Knowledge.
Splicing..... 1. Fixture. 2. Western Union. 3. Tap. 4. Aerial. 5. Aerial tap. 6. Cable.	Pliers, knife, alcohol torch or soldering iron, soldering paste, compound tape, friction tape, solder, gasolene torch.	Types of insulation and wire sizes. Methods of bending wire; applying tape and the skinning of wire. The use of and names of applied tools. The use of a "Standard Wire Gauge."
Bell..... 7. One bell, one button. 8. Two bells, one button wired in series. 9. Two bells, one button wired in multiple. 10. Three-wire return call system. 11. One-family house bell wiring, 12. Two-family house bell wiring. 13. Two-drop gravity annunciator. 14. Four-drop gravity annunciator.	Hammer, pliers, screwdriver, feeler bit, knife, rule, bells, buttons, batteries, sal ammoniac, friction staples, tape, No. 18 wire, paste, solder, torch, annunciators.	Construction and uses of the bell, button and battery. The fundamentals of arithmetic and the application of the rule. The knowledge of freehand sketching of a working plan. Methods of making corners, driving staples, tightening wires, unit connections. Clear perception of screw sizes.
15. Installation of simple telephone circuit.	Screwdriver, hammer, pliers, bit brace, bits, wire, telephone instruments.	Construction and uses of telephone instruments. Requirements of installation.

Processes.	Tools and Materials.	Knowledge.
Cleat and knob work..... 16. Stretching wires. 17. Dead ending. 18. Branch taps. 19. Single pole switch controlling one light. 20. Two lights, single pole switch controlling one of the lights. 21. Alternate from less No. 19, and have switch control other light. 22. Double pole switch and one light. 23. Two three-way switches controlling one light. 24. Two three-way switches and one four-way controlling one light. 25. Electroller two or three point control.	Hammer, pliers, bits, screwdriver, knife, rule, alcohol torch or soldering iron, tape, No. 14 wire, paste, cleats, knobs, tubes, receptacles, switches, fuses, cutouts, sockets, switch bases, lamps.	Knowledge of the "Fire Underwriters'" rules governing cleat and knob work. Construction, names and action of different kind of switches. The use of applied tools and an understanding of bit sizes. Construction and names of receptacles, bulbs, sockets, switch bases and fuses. The various uses of the Ohms law and fractions.
Metal moulding..... 26. Cutting. 27. Drilling and punching. 28. Connecting up fittings. 29. Securing base and capping. 30. Bending and grounding. 31. Bending. 32. Connecting to conduit and wood moulding. 33. Single pole switch and one drop light.	Punch, hand drill, cutter, hacksaw, pliers, knife, hammer, rule, fixture cord, switches, screws, fittings, sockets, solder, paste, tape, No. 14 wire.	Names and uses of metal moulding fittings. "Fire Underwriters'" rules governing metal moulding. Methods of bending.
Wood moulding..... 34. Squaring, trimming and mitering. 35. Drilling, countersinking and securing. 36. Installing wires, capping and making dead ends. 37. Connecting to fielding fitting 38. Connecting to kick and moulding blocks. 39. Single pole switch controlling one light. 40. Install a branch tap.	Torch, miter box, hammer, saw, screwdriver, knife, pencil, rule, hand drill, chisel, taplet, tapon, cutouts, rosette, receptacle, connecting fittings.	Construction and uses of wood moulding. Names of fittings and where used. Method of laying out working plan. Applied "Fire Underwriters'" rules.
B. X. cable..... 41. Cutting and stripping. 42. Fishing and pulling in. 43. Bending and grounding. 44. Connecting to the fittings. 45. One light and switch exposed work. 46. Installation of a concealed job of one light, controlled from a flush switch.	Hacksaw, pliers, hammer, file, screwdriver, knife, rule, taps, B. X. fittings, screws, torch, fish wire, clips.	Names and uses of B. X. fittings. "Fire Underwriters'" rules on this class of work. The advantage of B. X. cable. Names and uses of tools concerned.
Conduit..... 47. Cutting, threading and reaming. 48. Connecting and securing. 49. Bending and grounding. 50. Fishing and pulling in. 51. Bending. 52. Installing a service entrance.	Die, diestock, file, bending hickey, reamer, fish wire, pipe vise, pliers, Stillson wrenches, hammer, screwdriver, hacksaw, fittings, tape, paste, oil, solder, torch.	Names and uses of fittings. Methods of fishing, bending and connecting. The different sizes of conduit. The rules governing the installation. Trade and proper names for tools and fittings. The standard symbols for wiring.
Motors and generators: Taking down, cleaning and reassembling motor generator.	Screwdriver, wrenches, pliers.	Names and locations of various parts. Theory of operation. Practical tests in armature, fields, connections, bearings and brushes.

Radio Operation.

Water analogy of the wireless wave and its interception by means of an aerial.

Tuning-in the function of inductance and capacitance. Loose coupling; close coupling. Detecting by crystal and by bulb.

Erection of practical miniature aerials and ground connections.

Making simple receiving apparatus.

Morse code.

Minimum Requirements in Gardening.

Processes.	Tools and Materials.	Knowledge.
Spring:		
1. Study of varieties of seeds...	Seed samples, seed catalog.	To learn names of varieties best adapted to this climate and locality.
2. Prepare seed order.....	Pen, ink, seed catalog, order blank.	Proper method of ordering seed.
3. Germination tests.....	Small box, sawdust (or sand), cheesecloth, seed, pot label.	The value and importance of germination tests. Requirements for an accurate test.
4. Seed sowing in-doors in flats.	Flats, soil, seed, label, water.	Proper preparation of soil for seed boxes. Methods of planting in-doors.
5. Transplanting seedlings.....	Transplanting flats, soil, marking board, water, dibble.	Essentials for successful transplanting as firming the soil near the roots, etc.
6. Hot-beds:		
(*a*) Preparation.....	Fresh stable manure, manure fork, thermometer, shovel.	Importance of using fresh stable manure. Necessity of packing proper amount of manure in the hot-bed.
(*b*) Care.....	Hot-bed in operation.....	Importance of ventilation, watering and proper temperature.
7. Cold frames.....	Stakes, boards, hot-bed sash, hammer.	Difference between a hot-bed and cold frame. Uses of a cold frame.
8. Preparation of the garden plot:		
(*a*) Spading.....	Spade or spading fork.	Proper way to use a spade. Characteristics of and reasons for using lime. Importance of the rake in preparing a fine seed bed.
(*b*) Liming.....	Shovel.	
(*c*) Raking.....	Iron rake.	
9. Seed sowing out of doors:		
(*a*) Making the drill.....	Planting line, hoe.....	Importance of seed rows. Distance between rows. Distance between seeds in the row. Reason for packing soil over the seed.
(*b*) Planting seed.....	Seed marker.	
(*c*) Covering drill.....	Hoe (or planting label).	
10. Cultivating.....	Hoe, weeder (or rake).....	To preserve moisture and destroy weeds.
11. Thinning common vegetables.	.....	Importance and necessity of thinning for the protection of good quality vegetables.
12. Spraying.....	Sprayer, insecticide or fungicide.	Various groups of insects and diseases, and their general control.

Processes.	Tools and Materials.	Knowledge.
13. Summer care of the garden: (*a*) Weeding	Hand weeder	Improvement of appearance of the garden.
(*b*) Watering	Hose or watering pot	Proper method of watering the garden.
(*c*) Cultivating	(See No. 10.)	(See No. 10.)
(*d*) Spraying	(See No. 12.)	(See No. 11.)
(*e*) Successive plantings where needed.	Planting line, hoe, seed, marker.	Possibility of securing several short-seasoned crops off the same soil in one growing season.
Fall: 14. Crop gathering	Hoe, spading fork	Proper methods of harvesting crops with hand tools.
15. Winter storage: (*a*) In pits	Spade, straw or leaves, ventilation flue.	Characteristics of a good storage pit. Necessary requirements for good storage.
(*b*) In cellars	Sand (or leaves), box (or barrel).	Characteristics of a good storage cellar.
16. Preparing compost pile	Coarse manure, manure fork, fresh sods.	Proper way to make a compost pile.
17. Sowing cover crops	Rake, seed	Plants commonly used for cover crops. Reason for and value of a crop.
18. Planting: (*a*) Out-door bulbs	Trowel, spading fork, bulbs, manure.	Names and characteristics of the hardy out-door bulbs.
(*b*) In-door bulbs	Glass bowl, pebbles, water, bulbs.	Names and characteristics of the hardy in-door bulbs.
19. Making seed boxes and flats.	Saw, hammer, nails, rule, trysquare, pencil, plane, knife.	Dimensions and practice in making seed boxes and flats.
20. Repairing tools	Broken garden tool, new handle, file, hammer, sandpaper.	Necessity of having tools in working condition when the rush season opens in March and April.

Supplementary Problems.

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Minimum Requirements in Machine Shop Work.

Processes.	Tools and Materials.	Knowledge.
1. Cutting stock	Scale, vise, hack saw, hand or power.	Types and use of scales. Methods of holding stock. Hand and power hack saws — construction and uses.
2. Chipping	Hammer, cold or cape chisel, scale, scriber, try square, chalk.	Types and use of chisels. Method of holding tools. Testing.
3. Filing and polishing	Files, file card, try square, emery cloth, chalk.	Types, cuts and lengths of files. Methods of use. Testing. Grades and uses of emery cloth.

Processes.	Tools and Materials.	Knowledge.
4. Laying out centers	Scale, center punch, hammer, scriber, combination or try square, surface gauge, dividers, calipers.	Methods of locating centers and testing lay-out for same.
5. Drilling	Upright drill, twist drill, chuck, cutting compound.	Types and uses of upright drills. Methods of holding stock. Drilling requirements. Types and use of cutting compound.
6. Drilling and countersinking lathe center holes.	Combination drill and countersink, lathe, chuck, cutting compound.	Fundamentals of lathe types, construction and uses. Methods of holding stock. Combination drill and countersink requirements.
7. Grinding	Bench or pedestal grinder; diamond or disc wheel dresser.	Types and uses of abrasive wheels. Essentials of grinding. Angles of clearance for various tools.
8. Straight turning	Engine lathe, dog, lathe tools, calipers, scale, wrench, oil, micrometer caliper.	Detailed study of engine lathe types, construction and use. Requirements of elementary turning. Testing. Lubrication. Precision tool construction and uses. Reading a micrometer.
9. Knurling	Engine lathe, knurling tool, hand or machine, dog, scale, wrench, cutting compound.	Reasons for knurling. Construction and use of hand and machine knurling tools.
10. Taper turning	Same as for straight turning.	Methods of taper turning. Determination of angles for tapers.
11. Chuck turning	Lathe, chuck, calipers, scale, dog, lathe tools.	Types, construction and uses of chucks. Testing.
12. Tapping and threading, hand	Vise, tap, tap wrench, die, die stock, scale, try square, cutting compound.	Principles of threading.
13. Reaming, hand	Vise, reamer, wrench, square, cutting compound.	Principles of reaming. Types, construction and uses of reamers.
14. Shaper work	Shaper, cutting tool, square, scale, surface gauge, parallels, pinch downs.	Requirements of shaper work. Methods of holding work in place.
15. Plain milling	Milling machine, cutter, scale, micrometer caliper, cutting compound.	Construction and uses of milling machine. Milling process.
16. Forge work	Forge, gas or down draft, anvil, tongs, scale, calipers, steel square, hammer.	Temperature requirements for forming and welding. Prevention of cold shuts, fire cracks, etc. Calculating length of stock necessary for bent work; for welds, etc.
17. Heat treatment of steel	Forge, tongs, lap stick, oil, water, brine, cyanide of potassium crystals, pyrometer, lead bath.	Fundamentals of annealing, hardening, tempering, case and pack hardening. Properties of steel and alloys. Use of pyrometer. Use of lead bath.
18. Dividing head work on milling machine.	Milling machine, dividing head, cutters, scale, micrometer caliper, oil, cutting compound.	Index head construction and principles of use.
19. Finishing work to size	Various machines, files, file card, scale, calipers, micrometer caliper, oil, emery cloth.	Precision measurements. Methods of finishing work for accurate results. Testing methods.
20. Thread cutting, machine	Engine lathe, threading tools, center gauge, thread gauge, calipers, scale, thread calipers.	Change gear calculations. Types of threads. Proper cutting angles for tools. Testing.

Processes.	Tools and Materials.	Knowledge.
21. Power transmission.....	Motor, with direct or belt drive. Countershaft. Belt, rope or sprocket chain.	Elementary horse power calculations. Types and uses of various transmission mediums, such as belting, rope or sprocket chain. R. P. M. formulæ and application of same. Peripheral, cutting or rim speed; also proper cutting speed for various metals and alloys. Belt maintenance and repair.

Supplementary Problems.

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Minimum Requirements in Painting.

Processes.	Tools and Materials.	Knowledge.
Interior Painting: Dusting, shellacking knots, priming, sandpapering, second and third coats, glazing, painting walls, mixing paints, matching colors, graining, enameling, stippling.	Duster and putty knife, paint brushes, shellac brushes, sandpaper, ladders and staging, drop cloths and strainers, linseed oil and driers, outside varnish, turpentine, white lead, enamel, white zinc, tinting colors, paint pails.	Preparation of wood for painting. Preparation of walls for painting. Preparation of materials. Selection of materials. Brush technique. Handling tools. Study of materials. History of painting. Color study. Care of the health in the painting trade.
Wood Finishing: Removing varnish, sandpapering, bleaching, staining, mixing stains, filling, shellacking, varnishing, rubbing, polishing, waxing, refinishing furniture.	Varnish removers, sandpaper, scrapers, oxalic acid, ammonia, stains and fillers, pumice stone, rotten stone, varnishes, shellac, rubbing felt, wax, varnish brushes, shellac brushes, polishing brushes, varnish containers, colors in oil, colors in water, acids and alkalis.	Methods of finishing. Methods of refinishing. Study of open grain wood. Study of close grain wood. Shellac varnish. Method of obtaining and preparation for use. Method of holding tools and applying materials. Methods of staining. Methods of polishing. Mixing stains. Colors of different woods. Methods of waxing. Different finishes for wood. Use of polishing machines. Piano polishing. Reasons for poor work.
Decoration: Washing off calcimine, plastering, sizing, calcimining, relief work, drawing and design, stencil cutting, pounce making, gilding, stenciling, lining, glazing.	Sponges, plaster of paris, glue and alum, whiting and shellac, dry colors, water colors, stencil paper, stencil knives, pounce wheel, straightedge, gilding tools, gold and silver leaf, gold size, calcimine brushes, lining brushes, stencil brushes.	Method of removing calcimine. Method of sizing. Plasters. Mixtures of plaster. Mixtures of sizes. Mixtures of calcimine. Mixtures of colors. Method of transferring decorations. Preparation of gold and silver leaf. Handling tools and materials. Study of colors. Study of decorations. Study of ornament. History of art and decoration. Period decoration.
Sign Painting: Making sign boards, preparing sign boards, mixing paints and colors, lettering, half block letters, Egyptian letters, Roman letters, lettering with pens, smalting.	Paints used in lettering, lettering brushes, sign boards, gold leaf and silver leaf, smalts, rule, bronzes, water colors, pens, sizes.	Study of alphabets. Principals of spacing. Laying out. Methods of laying out work. Methods of using tools. Origin of the alphabet. Color harmony. Sign design.

Minimum Requirements in Printing.

Processes.	Tools and Materials.	Knowledge.
1. Learn layout of type cases....	Cases of type: (*a*) Capitals. (*b*) Lower case. (*c*) California job case.	Location of characters in cases. How to distinguish b-d-h-g, u-n, I-1-7.
2. Setting type..... (*a*) Three lines of straight matter. (*b*) Stickful.	Cases of type, composing stick, leads.	Position at case, how to hold composing stick, use of leads, how to pick up type and place it in stick, use of spaces.
3. Distribution.....	Case of type. Leads. (*a*) Three lines. (*b*) Six lines. (*c*) Nine lines.	How to pick up mass of type from galley. Correct method of holding type for distribution. How to pick up type with right hand and drop one letter at a time in case.
4. Set small poem, 2 or 3 stanzas, from reprint copy.	Case of type, composing stick, composing rule, line gauge, pica letter m's.	Idea of alternating indentions. Poetry does not require changing of spaces between words. Use of capitals. Punctuation. How to set composing stick with pica m's.
5. Distribution, 3 handfuls.....	Case of type, type, leads....	How to hold type. How to separate letters. Position of spaces and quads.
6. Set page of straight matter...	Case of type, composing stick, leads, galleys.	Use of different size spaces. Division of words. Justification. Use of leads between lines. Arrangement of sentences and paragraphs.
7. Emptying type on a galley....	Stick of type, galley.....	Skill in handling type. Proper position of type on galley.
8. Tying up type, blocking type on galley.	Mass of type, galley, string, furniture for lockup on galley, tweezers.	Method of tying. Length of string. How to secure string at each end. Loop-knot. How to wind string around form. How to block up type on galley securely to get proof.
9. Pulling proof on proof press...	Proof press, type form, brayer, ink, paper and galley, ink slab, benzine brush, benzine can.	How to place type in correct position on press. The use of ink, brayer and slab. How to place paper on type and how to remove it from type. How to run the roller over the paper. Need of moistening paper sometimes.
10. Proofreading marks..... (*a*) Copy marks and explanations. (*b*) Read proof.	Proofreading list of marks..	Proofreader's marks. Significance of marks. How to write them. How to apply them.
11. Correct type.....	Mass of type. Proof with correction marked, tweezers.	Skill in handling tweezers. Need of careful rejustification. Need of care in correcting. Ability to understand proof marks.
12. Lock up job press form..... (*a*) Plate. (*b*) Type form.	Stone, type, plate, furniture, quoins, reglets, chase, bearers, mallet, planer, quoin key.	How to place form in position. Arrangement of furniture, reglets, quoins, bearers. Use of key, mallet, planer. How to test for tightness. How to avoid spring, and how to lock up with sufficient squeeze. Two kinds of quoins and keys.
13. Oiling and cleaning job press...	Job press, oil can and waste, kerosene can and wiping rags.	Use of oil can, waste rags, kerosene. Necessity for neatness and cleanliness. Need for lubrication to prevent wear on bearings. Effect of kerosene on the ink and rollers. Need of washing ink to avoid drying of ink on press.

Processes.	Tools and Materials.	Knowledge.
13. (*a*) Oiling. (*b*) Washing rollers, disk and fountain.		
14. Feed small card.	Job press and cards.	Starting and stopping press. Use of gauges How to hold cards. How to place cards up to gauges. Need of careful feeding.
15. Inking up press.	Ink, job press with ink rollers.	Amount and method used in applying ink.
16. Placing chase in press.	Chase and press.	Relation of type form and bed of press. Use of form gripper.
17. Arranging tympan.	Pressboard and manila paper, screwdriver.	Use of tympan and result of too much or too little packing.
18. Setting gauges and grippers.	Stock grippers.	Necessity of noting position of these grippers.
19. Taking an impression.	Type form, ink, rollers, tympan.	Amount of impression.
20. Making gauges.	Rule and pencil, size of stock.	Amount of margins and how to distribute them.
21. Placing gauges.	Quads, glue, cardboard.	Guides to place the stock against when feeding the job.
22. Proof on stock for position and O. K.	Paper stock and press.	Position of job is O. K. Ready to be made ready.
23. Make-ready.	Tissue paper, overlaying knife and paste.	Use of a make-ready and method of using same.
24. Testing job make-ready.	Page stock and press.	Results of make-ready.
25. Oil top sheet.	Oil, top sheet.	Preventing a job from offsetting.
26. Taking impression for final O. K.	Paper stock and press.	Proper appearance of job when printed.
27. Feeding.	Paper stock and press.	Position of stock while feeding.
28. Counting machine.	Counting machine on press.	Machine registers each sheet that is printed.
29. Spreading stock to dry.	Drying rack.	Position of stock while drying.
30. Jogging.	Paper stock.	Ability to square up stock and pile it neatly.
31. Use of initials.	Initials, type and stick, leads, type gauge.	Shape harmony and tone harmony.
32. Set tags.	Stick, type, leads, rules, galley, type gauge.	Principals of display, shape harmony, tone harmony and the proper margins.
33. Set notehead.	Stick, type, leads, rules, galley, type gauge.	Principals of display, shape harmony, tone harmony and the proper margins.
34. Set billhead.	Stick, type, leads, rules, galley, type gauge.	Principals of display, shape harmony, tone harmony and the proper margins.
35. Set letterhead.	Stick, type, leads, rules, galley, type gauge.	Principals of display, shape harmony, tone harmony and the proper margins.
36. Job with rule border, butted.	Stick, type, leads, rules, galley, type gauge.	How rules are joined by butting.
37. Job with rule border, mitered.	Stick, type, leads, rules, galley, type gauge, also mitering machine.	Method of using a mitering machine and effect resulting.

	Processes.	Tools and Materials.	Knowledge.
38.	Job with type border	Stick, type, leads, galley, border.	Proper use of border.
39.	Set advertisement	Stick, type, leads, ruler, galley.	Characteristics of the typography of advertisements and the many ways of arranging same. The fundamental rules.
40.	Run type around cuts	Type, leads, galley and cuts. Line gage.	How to determine the proper dimensions.
41.	Set blank rule form	Type, leads, rules, galley	Characteristics of blank rule composition.
42.	Table composition	Type, leads, rules, galley	Characteristics of table composition.
43.	Box headings	Type, leads, rules, galley	How to determine amount of space to be used.
44.	Break up job for two and three colors.	Type, leads, rules, galley	Ability to make form register when locked in same position as preceding color.
45.	Imposition of card	Chase, type, quoins, furniture, bearers.	Position in chase.
46.	Imposition of circular	Chase, type, quoins, furniture, bearers.	Position in chase.
47.	Imposition of envelope	Chase, type, quoins, furniture, bearers.	Position in chase.
48.	Imposition of letterhead	Chase, type, quoins, furniture, bearers.	Position in chase.
49.	Imposition of billhead	Chase, type, quoins, furniture, bearers.	Position in chase.
50.	Imposition of tag	Chase, type, quoins, furniture, bearers.	Position in chase.
51.	Imposition of foundry	Chase, type, quoins, furniture, bearers, also foundry bearers.	Position in chase.
52.	Imposition of rule job	Chase, type, quoins, furniture, bearers.	Position in chase. How to prevent rules from cutting rollers.
53.	Imposition for a two-page form	Chase, type, quoins, furniture, bearers.	Position in chase and margins.
54.	Four-page form	Chase, type, quoins, furniture, bearers.	Position in chase and margins.
55.	Six-page form	Chase, type, quoins, furniture, bearers.	Position in chase and margins.
56.	Eight-page form	Chase, type, quoins, furniture, bearers.	Position in chase and margins.
57.	Imposition for color work	Chase, type, quoins, furniture, bearers.	Position in chase and margins.
58.	Feed press without form inside.	Press without type form	Workings of the press. What to do.
59.	Feed small card	Press, type, form, ink, paper stock.	How to handle small card while feeding press.
60.	Feed envelopes	Press, type, form, ink, envelopes.	Method of feeding envelopes.
61.	1. Feed circulars 2. Feed letterheads. 3. Color work.	Press, type, form, ink, paper stock.	Increased adaptability with each job. Pupil becomes self-confident and reliable.

Minimum Requirements in Sheet Metal Work.

Processes.	Tools and Materials.	Knowledge.
1. Measuring and cutting	Scratch awl, square, rule, straight and circular snips.	Reading rule. How to use scratch awl and shears. Use of straight-edge. Notching.
2. Hemming	Scratch gauge and folder	Construction of scratch gauge. Characteristics of bar folder.
3. Locking	Bar folder, brake	Setting gauge on folder. Preparing lock for grooving.
4. Drafting:		
I. Shop sketching	Pencil and paper	Ability to make and read simple sketches.
II. Parallel line development.	Drawing board, T-square, drawing instruments, triangles, scale, irregular curve.	Use of drawing equipment.
(*a*) Rectilinear		Orthographic projection.
(*b*) Cylindrical		Simple development.
III. Radial line development, conical.	Same as II. plus trammel points.	Development of conic sections.
IV. Triangulation, irregular forms.	Same as II	Methods and computations pertaining to irregular forms.
V. Approximate development.	Wing dividers, trammels, framing square, scratch awl.	Short-cut methods of developing problems.
5. Braking	Prick punch, brake	Transfer of patterns. Use of punch and brakes. Different types of braking.
6. Soldering (*a*) Preparing and tinning copper. (*b*) Making fluxes. (*c*) Cleaning the metal.	Solder, soldering copper, file, flux, furnace, solder scraper, dip cup.	Kinds of solder. Care of soldering copper. Proper heat for soldering. Kinds of fluxes and how to apply. Preparation of metal for soldering. Preparation of dip cup solution.
7. Wiring	Folder, mallet, wire, wire gauge, wire cutters, wiring machine.	Use of wire cutter. How to strike glancing blow with mallet. Characteristics of wiring machine.
8. Forming	Forming machine	Construction and use of forming machine.
9. Grooving	Hand groover, mallet	Dressing down with mallet. Groover size.
10. Burring	Burring machine	Method of holding metal. Construction and use of burring machine. Allowance for burr.
11. Hand forming	Mallet, blow horn stake	Method of forming by hand.
12. Beading	Beading machine	Addition of strength to article. Ornamentation. Division of space.
13. Double seaming	Setting hammer	Use of setting hammer.
14. Raising	Raising hammer, block	Allowance for stretching of metal.
15. Turning	Turning machine	Allowance of metal and adjustment of gauge. Method of holding metal.
16. Punching	Hammer, lead cake, wooden block (end grain), solid punch, hollow punch, lever punch.	Different methods of punching.

Processes.	Tools and Materials.	Knowledge.
17. Riveting	Rivet set, hammer, solid punch.	Proper use of hammer. Size of hole. Use of rivet and solid punch. Types of rivets.
18. Painting	Brushes, emery cloth, oil, paints.	Preparation of surface. Types and use of brushes. Method of applying paint.
19. Forging	Heavy hammer, anvil, soldering iron.	Preparation and proper heat of copper.
20. Hack sawing	Hack saw	Types of hack saw blades and selection for particular kinds of work.
21. Chiseling	Cold chisel, hammer	Proper angle of cutting edge.
22. Solder making	Mould, ladle, silverized lead, straits tin.	Required degree of heat. Preparation of various elements. Method of purifying.
23. Drilling	Drills, hammer, center punch.	Determining size of required drill. Care of drill. Use of punch.
24. Oiling machines	Oil can, machine oil, cotton waste.	Proper lubrication for various machines.
25. Helping	General equipment	Efficiency requirements.
26. Machine cutting	Squaring shears	Safety First. How to set gauge. Pressure required. Machine squaring and trimming.
27. Tinning sheet copper	Wad of tow (cotton waste), pure block tin, Nokorode or "killed" muriatic acid.	Degree of heat required to prevent firing of flux. Method of covering surface with tin. Water bath for hot metal.

Supplementary Problems.

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Minimum Requirements in Woodwork.

Processes.	Tools and Materials.	Knowledge.
1. Measuring and laying off distances on wood.	Rule, pencil, scoring knife	1-foot and 2-foot rule and characteristics.
2. Making lines at right angles to working faces.	Trysquare, pencil, knife, oil stone, sperm oil.	Names of parts of trysquare. Names of working faces. Relation between working faces and parts of trysquare. Sharpening of knife point. Care of trysquare. Sharpen pencil.
3. Setting gauge. Marking lines parallel to working faces. Setting spur. Sharpening spur. Freehand gauging.	Marking gauge, rule, oil stone, file.	Condition of spur for good work. How to tell difference between thickness and width. Names and uses of all parts of gauge. Method of setting. Reading measurements on handle.

Processes.	Tools and Materials.	Knowledge.
4. Sawing. (*a*) Rip. (*b*) Crosscut. (*c*) Miter. (*d*) Curve. (*e*) Oiling.	Rip saw, band saw, back saw, miter saw, turning saw, bench hook, saw horse, oil, miter box, vise.	Names of saws and parts. Characteristics of teeth. Correct position for each. Care of saw. Assembling turning saw.
5. Using and setting plane. (*a*) Planing. (*b*) Planing to line. (*c*) Block planing. (*d*) Surface planing. (*e*) Beveling.	Jack plane, fore plane, block plane, bench hook, try-square.	Names of planes and parts. Ability to set up and adjust planes. Condition of parts and cutting edge. Cleaning. Adjusting for different kinds of wood. Testing bench hook. Testing all working faces and numbering. Truing up bench hook.
6. Driving and setting nails.	Hammer, nail set.	Characteristics of common nails and their uses. How to nail without splitting. Correct use of hammer. Names of parts. How to read sizes of nails.
7. Boring. (*a*) Horizontal. (*b*) Vertical. (*c*) Oblique. (*d*) Depth boring.	Bit brace, bits.	Names and characteristics of common boring tools. Adjustment of bit in brace. Measuring bits. Reading sizes on shank.
8. The use of screws. Lubricating.	Screwdriver, countersink, bit, brad awl, soap or wax.	Names of parts of screws. How to read sizes. Parts of screwdriver.
9. Chiseling. (*a*) Horizontal. (*b*) Vertical. (*c*) Oblique.	Chisels, gouge, mallet.	Names and characteristics of common chisels and gouges.
10. Sandpaper. (*a*) Flat work. (*b*) Curve work.	Sandpaper, block.	Proper use of sandpaper with or without block. Ability to recognize grade by "feel" or sight.
11. Gluing. (*a*) For width. (*b*) For thickness.	Glue, clamps, hand screw, glue stick, newspaper.	Care and use of glue and clamps. Names and uses of parts of clamps and hand screws.
12. Jointing. (*a*) Butt joint. (*b*) Lap joint. (*c*) Edge joint.	Tools which processes require.	Meaning of joint terms. Where to use certain joints. Uses and size of dowels. Uses of dowel bit. Appearance of common joints when used.
13. Finishing. (*a*) Oiling. (*b*) Staining. (*c*) Waxing. (*d*) Painting. (*e*) Shellacking.	Determined by job on hand.	Composition of finishing material on the job. Proper application of material to surface.
14. Drawing. (*a*) Sketch. (*b*) Mechanical. (*c*) Freehand.	Pencil, rule, drawing board, T-square, 45-degree triangle, 30°–60° triangle, compass, ruling pen, paper, thumb tacks, ink.	Proper use and care of tools. Reproducing simple drawings. Reading simple drawings.
15. Machine sawing. (*a*) Ripping. (*b*) Cutting off. (*c*) Dado. (*d*) Angle cutting. (*e*) Rabbeting.	Circular saw, oil, oil can, ripping fence, cutting-off fence, jigs, wrench, push stick, safety device, ripping blade, crosscut blade, combination blade, dado head.	Setting up saw. Oiling. Care of motor. Adjusting fences. Adjusting height of saw. Setting measures. Setting width. Setting depth. Setting length. Setting angle. Cleaning machines. Care of waste. Starting and stopping saw. Characteristics and proper use of saw blades. Safeguards. Use of jigs for repeated operations.
16. Buzz planing. (*a*) Edge planing. (*b*) Beveling. (*c*) Surface planing.	Buzz planer or hand jointer, push stick, oil.	Oiling and cleaning. Starting and stopping. Adjusting guides for right angles; for bevel angles. Bed adjustment. Safety devices.

Processes.	Tools and Materials.	Knowledge.
17. Band sawing	Band saw, blades, guides, jigs, push stick, oil.	Oiling. Characteristics of different parts. Putting on and taking off saw blades. Throwing blade. Care of motor and belt. Setting machine. Safety devices. Starting and stopping machine. Tension. Cleaning. Use of jigs for repeated operations.
18. Turning	Lathe, turning tools, turning chuck, gouges, mallet or lead hammer, hammer, calipers, sandpaper, oil.	Cleaning and oiling machine. Starting and stopping. Names and uses of parts. Simple turning. Speed rates. Use of safety devices. Use of calipers.
19. Boring by machine, round hole mortising, depth boring, countersinking.	Mortising machine, chuck, drill bits, hollow chisel, bit, bushings, wrenches, guides, jigs, countersink.	Oiling and cleaning. Starting and stopping. Setting up bits. Use of bushings. Use of hollow chisel. Adjustment of bit. Oiling to prevent burning of chisel. Depth of adjustment. Adjustment of guides. Safety devices. Use of jigs.
20. Preparation of stock, hand sawing, machine sawing.	Rip saw, hand saw, circular saw, band saw, rule, framing square, pencil, oil.	Knowledge listed for processes 15 and 17. Board measure by arithmetic. B. M. by framing square.

Processes 15 to 20, inclusive, for boys in the A and B sections that have permits to operate machines signed by parent or guardian.

The refusal of a parent or guardian to sign a permit will not prevent the boy from obtaining a passing mark.

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CITY OF BOSTON
PRINTING DEPARTMENT

SCHOOL DOCUMENT NO. 11—1922

BOSTON PUBLIC SCHOOLS

OUTLINE OF WORK IN GEOGRAPHY FOR INTERMEDIATE CLASSES

BOSTON
PRINTING DEPARTMENT
1922

In School Committee, Boston, July 5, 1922.

Ordered, That the accompanying revised outline of work in geography for intermediate classes is hereby adopted and that one thousand (1,000) copies be printed as a school document to take the place of the outline of geography which appears in School Document No. 10, 1917 — Outline of Work in Geography and History for Intermediate Classes.

THORNTON D. APOLLONIO,
Secretary.

MEMBERS OF COUNCIL.

The members of the Council on Civics — History — Geography for Intermediate Schools are as follows:

LEONARD O. PACKARD, Normal School, *Chairman.*
THERESA G. O'BRIEN, Abraham Lincoln School, *Secretary.*

Representing the high schools:

ALVA T. SOUTHWORTH	English High School.
FRANCIS A. SMITH	Girls' High School.
WILLIAM H. H. PEIRCE	High School of Commerce.
EDWIN R. SAMPSON	Mechanic Arts High School.
BLANCHE G. WETHERBEE	West Roxbury High School.

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THEOBALD A. LYNCH	Bigelow School.
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MARY M. BYRNE	Lewis School.
MARY W. FOLEY	Mary Hemenway (Rochambeau) School.
SUSAN M. HOSMER	Oliver Wendell Holmes School.
ELLEANOR P. COX	Oliver Wendell Holmes School.

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ELIZABETH A. BURNS	Blackinton-John Cheverus School.
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LOTTA A. CLARK	Normal School.
SARAH A. LYONS	Practice and Training.

OUTLINE OF WORK IN GEOGRAPHY FOR INTERMEDIATE CLASSES.

This course of study has been prepared by the geography sub-committee of the Civics-History-Geography Intermediate Council.

The members of the Geography Committee are as follows:

Ona I. Nolan, *Chairman* .	Gaston School.
Elizabeth R. Brady . .	Henry L. Pierce School.
Elizabeth A. Burns . .	Roger Wolcott School.
Theobald A. Lynch . .	Frederic W. Lincoln School.
Etta A. Manning . . .	John Winthrop School.
William T. Miller . .	Elihu Greenwood School.
Theresa G. O'Brien . .	Abraham Lincoln School.
Leonard O. Packard . .	Boston Normal School.

GRADE VII.—Part I.

I. Aim.

A. To give the child an intelligent understanding of the physical and human factors which have influenced the territorial, industrial and commercial growth of the United States and have secured her leadership in the world.

B. To give the child power to recognize and apply geographic principles.

C. To train the child for intelligent citizenship:

1. Through a knowledge of the relations of his locality to other parts of the country as shown by a study of resources, industries and trade.
2. Through a knowledge of the resources of the country and the need of conserving them.
3. Through the acquisition of the habit of keeping in touch with current affairs so that he may be able to act wisely in matters affecting his locality, his state and his country.

II. Content.

A. General view.

1. A brief survey of the geographic regions of the United States to gain a general knowledge of the physical features and natural resources which have influenced settlement and industrial growth in each region.
2. The brief survey of the geographic regions includes:

a. Extent and character of each region.

(1) New England, the northern extension of the Appalachian highland.
(2) The Atlantic and Gulf coastal plains.
(3) The Appalachian highland and plateau.
(4) The central and great plains.
(5) The Rocky Mountain region.
(6) The western plateau.
(7) The Pacific mountains and lowlands.

b. This study constitutes a general treatment of the United States as a whole in preparation for the more intensive work that follows. Study in each geographic region the reasons for the dominant activities; these reasons should bring out the main characteristics of the geographic regions. The study of the geographic regions is approached from the standpoint of human activities.

B. Intensive study of the United States.
   1. Industrial regions.
      a. Northeastern States.
      b. North Central States.
      c. Southern States.
      d. Western States.
   2. Territorial possessions.
      Bases for acquisition, and value of each.

C. Study of neighboring regions.
   Canada — Mexico — West Indies.
   Brief survey of each.
   Relations with United States.

D. Minimum list of cities.
   As a result of the work of this grade pupils should possess a knowledge of the significance and the accurate location of each of the following cities:
   1. At least eight of the leading cities of New England.

Boston.	Lynn.	Holyoke.
Fall River.	Manchester.	New Haven.
Worcester.	New Bedford.	Lawrence.
Bridgeport.	Bangor.	Waltham.
Providence.	Portland.	Hartford.
Lowell.		

   2. Cities of the United States outside of New England.

New York.	Albany.	Chicago.
Washington.	Philadelphia.	St. Louis.
Minneapolis.	St. Paul.	* Des Moines.
Baltimore.	Grand Rapids.	* Norfolk.
* Youngstown.	New Orleans.	Galveston.
Denver.	Cleveland.	Seattle.
Detroit.	Omaha.	Pittsburgh.
Kansas City.	Duluth.	Milwaukee.
Butte.	Birmingham.	Cincinnati.
Buffalo.	Los Angeles.	Paterson.
Toledo.	Manila, P. I.	Louisville.
Portland, Ore.	Richmond.	Spokane.
Salt Lake City.	San Francisco.	

   3. Additional cities.

Montreal.	Ottawa.	Halifax.
Quebec.	Vancouver.	

UNITED STATES.

I. The Northeastern States include Maine, New Hampshire, Vermont, Masssachuetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia.

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* Optional.

A. Industries (see key to the study of industries).

Manufacturing, commerce, mining, fishing, ship-building, quarrying, agriculture, lumbering.

Natural and human factors influencing development of products, areas and centers of each industry. The activities italicized are those of main importance and should be the dominant association with the region.

B. Relations to other regions of the United States.

C. The part which this group of states plays in the foreign commerce of the United States.

1. Products exported.
2. Products imported.
3. Ports through which these products pass.

D. Special influence of scenic beauty.

E. A few suggested problems.

1. Why has manufacturing developed so extensively in the Northeastern States?
   - *a.* Proximity to sources of power—coal, water power, petroleum.
   - *b.* Accessibility of raw materials—iron, lumber, cotton, wool, petroleum, sugar, fruits, hides, clay, sand, lime.
   - *c.* Early start—skilled labor.
   - *d.* Favorable legislation in early days.
   - *e.* Proximity to markets.
   - *f.* Easy transportation.
   - *g.* Capital.
2. Why is Boston the metropolis of New England?
   - *a.* Fine harbor.
   - *b.* Accessible hinterland.
     - Near hinterland.
     - More remote hinterland.
   - *c.* Accessible fishing grounds.
   - *d.* Easy transportation.
     - Water.
     - Rail.
     - Truck.
   - *e.* Industrial development of hinterland.
   - *f.* Educational opportunities.
3. Why does New York have more foreign trade than Boston?
   - *a.* Better harbor development.
   - *b.* Serves a more remote hinterland.
     1. Hinterland a producing area for export trade.
     2. New York distributing market for import trade.
     3. Importance of the Erie Canal in the early development of the port.
   - *c.* Transportation rates from the West favor New York.

4. The Lake Erie section is one of the most important fruit growing sections in the United States. Why?
   a. Soil.
      Lake plains.
   b. Climate.
      1. Effect of the lakes—tempers climate.
      2. Sufficient rainfall.
      3. Westerly winds.
   c. Nearness to markets.
      New York and surrounding cities of large population.
   d. Advantage of easy transportation.
      Numerous railroads.
5. Why is truck farming increasing in importance along the Atlantic coastal plain?
   a. Large growing cities need more vegetables.
   b. Easy transportation across level coastal plain to the cities.
   c. Use of commercial fertilizer.
   d. Canneries for preserving fruits.
6. Additional problems for the study of the Northeastern States.
   a. Why does Buffalo manufacture flour?
   b. Why do these states depend upon other sections of the United States for food?
   c. Why is fishing an important occupation of the people?
   d. Why has Pittsburgh been called the "Smoky City?"
   e. Why was shipbuilding an early industry of the New England States?

F. Cities.

Boston.	Lawrence.	Albany.
Providence.	Hartford.	Philadelphia.
New Bedford.	Washington.	Bridgeport.
Portland.	Pittsburgh.	New Haven.
New York.	Worcester.	Bangor.
Baltimore.	Fall River.	Holyoke.
Lowell.	Waltham.	Buffalo.
Manchester.	Lynn.	Paterson.

The children should be held responsible for at least eight of the leading New England cities.

II. North Central States include Ohio, Indiana, Illinois, Wisconsin, Michigan, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas.

A. Industries.

Farming, stock raising (Dairying), *manufacturing, mining,* ommerce, lumbering.

Influence of natural and human factors in development of products, areas, centers of each industry.

B. Relations to other regions — particularly New England.
C. The part which this group of states plays in the foreign commerce of the United States.
   1. Products exported.
   2. Products imported.
   3. Ports through which these products pass.
D. A few suggested problems.
   1. Why do the people of the United States depend to a large extent upon these states for their food supply?
      a. Level plains favorable for:
         (1) Agriculture with large use of machinery.
         (2) Stock raising encouraged by large production of fodder.
         (3) Railroad building.
      b. Deep fertile soil.
      c. Warm summers and sufficient rain in the growing season. Continental climate.
      d. Navigable rivers and lakes for distribution of foodstuffs.
      e. Proximity to manufacturing cities.
      f. Unfavorable conditions for farming in parts of the country depending upon the Middle West.
   2. Why is Chicago the largest city in the West?
      a. Location near the center of large areas of production — forest, agriculture, grazing.
      b. Location near mines.
      c. Natural meeting place for routes connecting East and West.
      d. Development as:
         Receiving center for raw materials.
         Distributing center for finished products.
   3. Additional problems for the study of the North Central States.
      a. Why has Detroit grown so rapidly?
      b. Account for the industries of Minneapolis, St. Paul, Kansas City, Duluth, Grand Rapids.
      c. In the eastern part of this section cattle are raised mainly for dairy products. In the western part of this section cattle are raised for meat, hides and by-products. Why?
      d. How do the occupations of the North Central States affect the commerce of the country?

E. Cities.

Kansas City.	Omaha.	St. Paul.
Grand Rapids.	Chicago.	Toledo.
* Youngstown.	* Des Moines.	Minneapolis.
Milwaukee.	Duluth.	Detroit.
St. Louis.	Cincinnati.	Cleveland.

* Optional.

III. Southern States include Virginia, West Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, Texas.

A. Industries.

Farming, lumbering, commerce, mining, stock raising, manufacturing.

Influence of natural and human factors in development of products, areas, centers of each industry.

B. Relations to other regions of the United States.

C. The part which this group of states plays in the foreign commerce of the United States.

1. Products exported.
2. Products imported.
3. Ports through which these products pass.

D. A few suggested problems.

1. Why may we expect the South to be a close rival of New England in future manufacturing?
   (*a*) Power in the South — coal, petroleum, water power.
   (*b*) Available raw materials — cotton, tobacco, sugar, rice, cattle products, lumber, minerals.
   (*c*) Easy transportation by rivers and railroads.
   (*d*) Abundance of cheap labor.
   (*e*) Accessibility to markets.
   South American.
   European.
   United States.
2. In our country rice is raised in great quantities in Arkansas, Louisianna and adjacent regions.
   Why?
   (*a*) Level lands easily flooded.
   (*b*) Climate.
   Warm — heavy summer rains.
   (*c*) Alluvial lands of the Mississippi river.
   (*d*) Improved machinery.
   (*e*) Superior keeping quality of rice.
   Dry kernel — protecting husk.
   (*f*) Future outlook: The United States an *exporter* rather than an importer of rice.
3. What are the resources of these states?
   (*a*) Extensive areas of farming land, fertile soil in the most part; temperature and rainfall, favorable to the production of tobacco, cotton, sugarcane, corn, alfalfa, vegetables, fruits
   (*b*) Grazing lands.
   (*c*) Forests.
   (*d*) Minerals.
   (*e*) Rivers — transportation, water power.
   (*f*) Harbors.

4. Additional problems for the study of the Southern States.
   - *a.* Why is farming the leading occupation of the South?
   - *b.* Why is New Orleans the largest city of the South?
   - *c.* Why have the Gulf coast ports increased in commerce?

E. Cities.

* Norfolk. Birmingham. New Orleans. Louisville. Tampa. Galveston. Dallas. Mobile. Richmond.

IV. The Western States include Montana, Wyoming, Colorado, New Mexico, Idaho, Utah, Arizona, Washington, Oregon, Nevada, California.

A. Industries.

Stock raising, *agriculture*, *mining*, *commerce*, lumbering, fishing.

Natural and human factors favoring development of products, areas and centers of each industry.

B. Relations to other regions.

C. The part which this group of states plays in the foreign commerce of the United States.
   1. Products exported.
   2. Products imported.
   3. Ports through which these products pass.

D. A few suggested problems.
   1. Why is farming important in the Western States?
      - *a.* Irrigation.
        - (1) Land irrigated contains much plant food.
        - (2) Production greater on irrigated land.
        - (3) Variety of crops result of irrigation.
      - *b.* Volcanic soil — good for farming.
      - *c.* Dry climate checks insect pests.
      - *d.* Dry farming.
      - *e.* Temperature and rainfall of the valleys of the Pacific Coast States favor agriculture.
      - *f.* Scientific farming as result of experiment stations.
   2. What has helped Portland, Oregon, to become one of the leading commercial cities of the Pacific Coast?
      - *a.* Location.
        - (1) On deep broad estuary makes ocean communication good.
        - (2) Forest lands accessible.
        - (3) Farms and fruit producing regions accessible.
      - *b.* Development of industries due to available resources.
      - *c.* Trade relations with other Pacific Coast cities, Canada, Alaska and the Far East.

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* Optional.

3. Additional problems for the study of the Western States.
   - *a.* What advantages does the West offer for manufacturing?
   - *b.* Why is Los Angeles the largest city of the Western States?
   - *c.* Why is fishing an important industry of the Western States?

E. Transportation routes.
   1. Northern routes.
   2. Colorado routes.
   3. Southern routes.

F. Natural scenery.
   Mountains.
   Yellowstone National Park.
   Glacier National Park.
   Yosemite National Park.
   Grand Canyon of Colorado.
   Forest reserves.

G. Cities.

San Francisco.	Seattle.	Denver.
Butte.	Los Angeles.	Spokane.
Salt Lake City.	Portland.	

Possessions of the United States.

Value to the United States.
For their products as markets, as coaling and naval stations.

A. Alaska.
   Agricultural products, minerals, fish.
B. Hawaii, Philippines, Porto Rico.
   Agricultural products.
C. Guam, Samoan Islands, Virgin Islands.
   Naval and coaling stations.
D. Panama Canal.
   Commercial importance.

Neighboring Regions.

I. Cuba, Haiti, Jamaica, Bahamas.
   A. Industries.
      Agriculture, fishing, mining.
   B. Important centers.

II. Canada.
   A. Geographic divisions.
      Relations to corresponding divisions of the United States.
      Eastern section.
      Central plain.
      Western area.
      Northwest territories.
   B. Study of industries according to products, regions, centers.
   C. Commerce — centers.
   D. Value to mother country.

III. Mexico and Central America.
  A. Geographic divisions.
    1. Lowland.
    2. Plateau.
    3. Mountain regions.
  B. Study of industries according to products, regions, and centers — mining, agriculture, grazing.
  C. Commerce—centers.
    Exports and imports.

Part II. — The Teaching of Geography.

Suggested key to the study of industries.

I. Manufacturing.
  A. Conditions affecting development of industry.
    1. Proximity to sources of power.
      Water, coal, petroleum.
    2. Accessibility of raw materials.
    3. Labor—abundant, skilled.
    4. Proximity to markets.
    5. Easy transportation.
    6. Capital.
    7. Government aid.
  B. Centers.
    Conditions determining location.
  C. Products.

II. Agriculture.
  A. Conditions affecting industry.
    1. Character of topography.
    2. Quality of soil.
    3. Climatic conditions.
      a. Temperature.
      b. Rainfall.
    4. Irrigation.
    5. Dry farming.
    6. Proximity to markets.
    7. Transportation.
      a. Conditions affecting transportation.
        Preservation of food products.
          (*a*) Refrigeration.
          (*b*) Drying.
          (*c*) Canning.
    8. Use of improved machinery.
    9. Attitude of government.
  B. Products and regions.
  C. Centers.

III. Ranching or stock raising.
  A. Conditions affecting development of industry.
    1. Climatic conditions—rainfall, temperature.
    2. Nature of vegetation.
    3. Extent of regions.
    4. Proximity of markets.
    5. Improved methods of transportation.

B. Centers.
C. Products.

IV. Fishing.
A. Fishing grounds.
1. Factors determining location.
a. Depth of water.
b. Abundant food.
c. Temperature of water.
2. Kinds of fish.
By-products.
B. Methods.
C. Centers.

GRADE VIII.

Part I.

I. Aim.
A. To give the child a knowledge of the industrial and commercial development of the world powers.
B. To give the child a sympathetic understanding of the character, living conditions and problems confronting the people of these world powers.
C. To give the child an appreciation of the economic and financial interdependence of the world powers.
D. To give the child a concept of the United States as a world power and to lead him to understand the responsibilities of the American people in their relations with other nations and thus aid in training him for the responsibilities of American citizenship.
E. To aid the child in acquiring the habit of keeping in touch with current affairs in all parts of the world, especially with movements affecting the relationships of the United States.

II. Content.
A. General view.
Interdependence of the world powers emphasizing the relations of the United States with these nations.
B. Intensive study.

		Approximate Time Allotment.
1.	Great Britain and colonies	5 weeks
2.	France and colonies	5 weeks
3.	Germany and Central Europe	4 weeks
4.	Italy	3 weeks
5.	Russia, Baltic and Balkan countries	3 weeks
6.	China	3 weeks
7.	Japan	3 weeks
8.	Argentina	2 weeks
9.	Brazil	2 weeks
10.	Chile	2 weeks
11.	United States	5 weeks

NOTE.—The study of the United States may be accomplished by frequent comparisons with the other countries as the work develops throughout the year or it may be reserved for a comparative study at the close of the year.

C. Detailed outlines of all countries.

Great Britain.

Great Britain's influence among the nations of the world is due in large measure to the fact that she controls a large portion of the world, and to the development of her manufactures and commerce.

I. Great Britain relies upon other countries for:

A. Foodstuffs.

1. Causes of Great Britain's need.
   - *a.* Density of population.
   - *b.* Limitation of natural resources.
2. Countries supplying foodstuffs.

B. Raw materials.

1. Kinds of raw materials supplied.
2. Countries supplying them.
   United States, colonies of Great Britain, other countries.
3. Conditions making it necessary to obtain these articles abroad.
   Efforts to make the empire as independent as possible of other countries.

Problem I. Of what value are the colonial possessions to Great Britain?

1. Sources of foodstuffs and raw materials.
2. Markets for manufactured goods.
3. Homes for surplus population.
4. Sources of man power and revenue.
5. Forts and coaling stations.

II. Other countries depend upon Great Britain for:

A. Manufactured goods.

1. Nature of goods.
2. Conditions making the output possible.
   - *a.* Natural resources of the country.
   - *b.* Character of the people.
   - *c.* Compare advantages of conditions with those of the United States and other manufacturing countries.
3. Countries to which sent.
   United States, colonies of Great Britain, other countries.

Problem II. Why did manufacturing become so important in Great Britain?

1. Proximity to sources of power.
2. Accessibility to raw materials.
3. Proximity to markets.
4. Easy transportation.
5. Capital.
6. Skilled labor.
7. Early start.

4. Means of transportation of manufactured goods.
   a. Merchant marine of Great Britain.
      (1) Compare size with that of other countries.
      (2) Conditions favoring development.
      (3) Relation to development of cities.
   b. Chief trade routes and typical cargoes.

III. Cities — manufacturing and commercial:

London.	Liverpool.	Manchester.
Birmingham.	Sheffield.	Leeds.
Bradford.	Hull.	Sydney.
Southampton.	Dublin.	Newcastle.
Belfast.	Glasgow.	Edinburgh.
Aberdeen.	Calcutta.	Queenstown.
Cardiff.	Melbourne.	Alexandria.
Cape Town.		

Problem III. Why have more large cities developed on the eastern coast of Ireland than on the western?

1. Cities on the eastern coast.
   (*a*) Near coal and iron of England.
   (*b*) Near English markets.
2. Cities on the western coast.
   (*a*) Far from sources of power.
   (*b*) Fine harbors undeveloped.

Problem IV. Why is Glasgow one of the leading ports on the western coast of Great Britain?

1. Proximity to iron and coal.
2. Importance of shipbuilding.
3. River port with ocean commerce.
4. Great railroad center.
5. Receiving and distributing center for the products of the Scottish lowlands.
6. Nearness to markets of world.

FRANCE.

I. Resources.
   A. Productive regions.
      1. Agricultural.
         Wheat, rye and other cereals, potatoes, sugar beets, grapes and other fruits, flowers, mulberry trees. Paris area (in rich agricultural section and on the highway of travel), trade center for clothing, millinery, jewelry.
      2. Central plateau.
         Coal, iron and clay.
         Cattle, sheep and goats.
      3. Bay of Biscay plain.
         Forests.
         Fishing grounds near the coast.

B. Development of resources due to:
   1. Character of people.
   2. Climate.
   3. Surface and soil.
   4. Inland waterways.
   5. Excellent railways and tunnel connections.

Problem I. Why are beautiful ribbons manufactured in the region of St. Etienne?
1. Abundance of coal and iron.
2. Presence of water power.
3. Large quantities of raw silk in Rhone valley.
4. Skill of French women in care of silkworms and artistic sense in weaving.
5. Peculiar quality of water of mountain streams which aids in making beautiful, permanent colors.

II. France gives to world:
Textiles, wine, clothing, perfumery, china.
Exports of Havre, Bordeaux, Marseille.

Problem II. Why is France noted for the manufacture of luxuries?
1. Character of people.
   (*a*) Love of beautiful.
   (*b*) Artistic sense.
   (*c*) Painstaking industry.
2. Abundance of clay, silk, flowers and goatskin that are adapted to the creation of beautiful china, ribbons and velvets, perfumery and gloves.
3. High grade and distinctive quality of her luxuries have caused a demand for them in the world's markets.

Problem III. What advantage has the double sea front been to France?
1. Atlantic sea front.
   a. Receiving ports for northern European and American foodstuffs and raw materials.
   b. Distributing ports for manufactured goods to American and northern European countries (gloves, clothing, cottons, wines, toys).
2. Mediterrrean sea front.
   a. Receiving port for raw materials and foodstuffs from Asia, Africa, Russia and Australia.
   b. Proximity of colonies.
   c. Distributing port for manufactured goods to Asia, Africa, Russia and Australia (silks, soaps, perfumes).
   d. Development of distinctive industries such as soap making.

III. France receives from the rest of the world:
Raw materials and foodstuffs.
   1. Sources of supply.
      Imports of Havre, Bordeaux and Marseille.
   2. Transportation routes.

Problem IV. Compare the colonial policy of France and England.

1. France.
   Encourages native development and trade relations, thereby gaining colonial co-operation.
2. England.
   Imposes English customs and institutions and dominates the development.
   English capital is invested to build railroads and to develop industries.

Problem V. How will the return of Alsace-Lorraine affect the industrial development of France?

1. Increased resources valuable for use in industry.
   a. Mineral — iron, coal, potash.
   b. Agricultural products — grapes.
2. Gain of textile centers.

IV. Cities.

Paris.	Calais.	St. Etienne.	Lyon.
Lille.	Rouen.	Havre.	Bordeaux.
Limoges.	Nantes.	Marseille.	

GERMANY.

Introductory Problem: How did the World War change Germany?

General answers.

A. Territorially.
B. Politically.
C. Commercially.

A. Territorial changes.

Problem I. What was the territorial extent of Germany in 1914?

1. Boundary.
2. Area.
3. Population and density.
4. Colonies — location.

Problem II. What territory did Germany lose in the settlement of the World War?

1. Given to other nations.
2. Parts of new nations.
3. Present boundaries, area, population and possessions of Germany.

B. Political changes.

Problem. What was the form of government of Germany in 1914?

1. Historical development of the empire.
2. Why the German government was called an "autocracy."

A and B should be treated very briefly, with no attempt to be exhaustive. The aim should be to give the general impression that important changes have taken place in Germany.

C. Commercial changes.

Problem I. What were the great resources of Germany in 1914?

1. Mineral.
2. Agricultural.
3. Colonial.
4. Commercial.

Problem II. Why was Germany a great manufacturing nation?

1. Natural resources.
2. Inventive skill and native industry.
3. Business enterprise.
4. Transportation facilities.

Problem III. Why did Germany wish to extend her political influence?

1. Trade alliances.
2. Pan Germanism — to get control of sources of raw materials and of markets for manufactured goods.

Problem IV. What commercial advantages has Germany lost?

1. Natural resources — Saar Valley, Alsace, etc.
2. Colonial resources and markets.
3. Merchant marine.
4. Credit and financial strength.

Problem V. (Optional.) Should the world trade with Germany?

1. Need of German products in the rest of the world.
2. Need of German markets for world producers of raw materials.
3. Interdependence of nations of the world.

Problem VI. How can the rest of the world prevent any nation from making another attempt to gain supremacy?

1. The League of Nations.
2. Disarmament.
3. Democratic governments.

Central Europe.

Introductory Problem: What great territorial changes did the World War produce among the nations of Central Europe?

A. Nations of Central Europe in 1914.

1. Size.
2. Resources.
3. Government.
4. Commerce.

B. Present nations.

Problem I. On what basis were the new nations established?

1. Divisions — simply treated.
2. Names and approximate locations and sizes of new nations. (Poland, Czechoslovakia, Austria, Hungary, Jugoslavia.)

Problem II. Why are the new nations of Europe so poor at present?

1. Their resources.
2. The need of co-operation between countries having minerals and fuel, and those having agricultural resources.

Problem III. (Optional.) Would it be better for these small countries to be united in an empire or confederation?

1. The advantages of uniting the different kinds of resources.
2. The danger of jealousies and disagreements.
3. The possibility of securing co-operation through commercial treaties.

C. Cities.

Berlin.	Hamburg.	Bremen.	Essen.
Belgrade.	Prague.	Budapest.	
Munich.	Breslau.	Vienna.	

Italy.

Introductory Problem: Why is the world indebted to Italy?

1. Fundamental ideas of law.
2. Pioneer work in building of roads, aqueducts and bridges.
3. Contributions to painting, architecture, music and poetry.

I. Resources.
- A. Mediterranean location.
- B. Agricultural lands.
  1. On slopes of the Alps.
     Fruits.
  2. Plain of the Po river.
     Wheat, rice, corn, mulberry trees.
  3. On slopes of the Apennines.
     Fruits — olives, oranges, lemons, chestnuts, grapes.
  4. Adriatic coastal plain.
     Wheat, fruits.
- C. Grazing lands.
  Cattle, sheep, goats.
- D. Minerals.
  Marble, sulphur.
- E. Forests.
- F. Fisheries.
  Sardines, corals, tortoise shells.
- G. Rivers for power and irrigation.
- H. Beauty of scenery.
  Italian Alps, Italian lakes, Riviera.

II. Limitations.
- A. Lack of coal and iron.
- B. Lack of variety of raw material.

III. Trade relations.

Exports — macaroni, fruits, nuts, vegetables, wines, silk, glassware, lace, dairy products.

Imports — wheat, coal, iron and steel goods, cotton, hides, textiles.

IV. Cities.

Rome.	Florence.	Palermo.
Milan.	Genoa	Trieste.
Naples.	Venice.	Fiume.

V. A Few Suggested Problems.
1. Why may we expect Italy to do more manufacturing in the future?
2. Why are most of the large cities of Italy located in the north?
3. Why do so many people emigrate from Italy?

Russia.

I. Resources.
- A. Human.

An unused resource — large number of people, illiterate, careless, but vigorous.

Compare with English, French, Germans. Enterprises have been controlled by English, Germans, Americans.

B. Climatic.

Variety of climate.

Land extends from the cold north to the land of cotton and corn.

Rainfall in many places insufficient for agriculture, but favorable for grazing.

C. Material.

1. Stretches of level land — great possibilities for railroad and canal building.

Problem I. Why are the rivers called the best roads in Russia?

1. Few railroads have been built.
2. Rivers are long.
3. Navigable.
4. Currents comparatively slow.
5. Flow across plains through forests.
6. Easily connected by canals so that it is possible to go from the Caspian to the Baltic and White Seas by water.
7. Means of easy and cheap transportation.

Zones of production.

a. Forests.

Pine, fir, oak, beech, birch.

"Coal is to Great Britain what the forests are to Russia."

Fur-bearing animals found in these forests — sable, fox, otter, bear.

b. Agricultural lands.

(1) Northern plain.

Work of glacier has caused the soil to be poor and sandy — suitable for rye and sugar beets. Russia exports more wheat than rye but raises more rye than wheat. People great rye eaters.

(2) Black earth zone.

Rich soil, sufficient rainfall.

Rye, barley, oats, potatoes, flax.

Problem II. What effect did the arrangement for land ownership have upon production?

1. Discouraged the use of machinery — farms too small.
2. Farmers had little ambition to work hard as a committee could dictate what kind of crops should be raised, when they should be planted and harvested. Plots changed from time to time. Small yield per acre.
3. South and Caucasus region.

Grapes, tobacco, corn, olives, cotton.

4. Arid belt.
   Cattle, sheep, horses.
   Conditions favoring the industry.
   Semi-arid conditions.
   Temperate climate.
   Extensive, cheap pasture lands.
5. Fish.
   Lower Volga and Caspian Sea among most important fishing grounds in the world.
6. Minerals.
   Regions.
   Ural, Caspian, Caucasus, Moscow.
   Iron, copper, manganese, platinum, graphite, gold, silver, zinc, petroleum, salt, mercury, coal.

Problem III. Why is there comparatively little manufacturing done in Russia?

1. Scarcity of coal and iron.
2. Lack of capital.
3. Lack of skilled labor.
4. Distance from markets.
5. Opportunities for earning a living on the farm — factory not attractive.

Problem IV. Moscow is a center for iron, steel, silk, woolen and cotton manufactures and sugar refining. Why?

1. Iron and coal accessible.
2. City located in a thickly settled part of the country. Markets at hand.
3. Industrial raw materials easily obtained.
4. Railroad and water connection help commerce and transportation.

II. Limitations.

A. Character of people.
"The Russian peasant is the Russian nation. He tills the fields, fills the factories, consumes the tea, pays the taxes, equips the army, fights the battles, mans the ships; he holds in his breast the destiny of the Slav race."
At least 70 per cent illiterate — experience limited.

B. Coast line.
Character and result — few good harbors.

C. Climate.
Effect on ports and rivers and on the development of the nation.

NOTE.— Not more than three lessons to be given to the study of the six following countries.

FINLAND. (Optional.)

I. Name — Swedish for marshland.
II. Resources.
A. Forest lands.

B. Farm land.
Products — rye, barley, potatoes, oats.
Farming backward — only 8½ per cent cultivated.
C. Water power.
Rivers not navigable but valuable for transporting logs and for water power.
D. Fish and fur products.
E. Intelligent people — sturdy race.

III. Limitations.
Lakes form network separated by deep forests and impassable marshes. Overcome by draining land — connecting lakes with canals, making a continuous waterway.

IV. Important city.
Helingfors.

ESTHONIA. (Optional.)

I. Resources.
A. Forests.
B. Agricultural lands — rye, oats, barley, flax.
C. Port.
Reval — open all year.

II. Manufacturing.
A. Cotton.
B. Metal.
C. Cement.

LATVIA. (Optional.)

I. Provinces included.
Courland, parts of Livonia, West Russia, East Prussia.

II. Population, 3,000,000.

III. Agriculture.
A. Small farms.
Large estates of so-called "Baltic Barons" broken into farms forty to fifty acres each. Compare with France, England, Russia.
B. Need for agricultural implements and machinery.

IV. Efforts to encourage industrial activities.
Until April 1, 1926, following admitted free:
Industrial machinery and equipment.
Raw materials.
Semi-manufactured goods for completion.
Compare with government encouragement in England and France.

V. Cities.
Riga. Libau.

LITHUANIA. (Optional.)

I. Resources.
A. Agricultural.
Small farms but antiquated systems and equipment.
Flax most important — also rye, wheat, potatoes, oats, barley.

B. Forests.
Extensive — pine, fir, oak.
Exploited by Germany.
British to gain concessions for development.

II. Manufacturing.
Flour — small mills, wind, water power, no steam power.

III. Exports.
Flax, timber, foodstuffs, textiles.

IV. Centers.
Problem. Why is Kovno important?
1. Geographical position.
2. Abundant, cheap labor.
(Railroads drawback — inadequate, impoverished.)

POLAND. (Optional.)

I. Resources.
A. Agricultural lands.
B. Minerals.
Salt, coal, iron (last two found near Warsaw, Lodz).

II. Exports.
Beet seed, flax, wool.

III. Imports.
All kinds of tools, farming machinery.

IV. Centers.
1. Warsaw manufactures cotton, wool, linen goods; breweries and distilleries important.
2. Lodz — manufacturing center.
3. Danzig — international port.

UKRAINE. (Optional.)

I. Resources.
A. Rich farming lands.
Includes most of black earth belt in which wheat is raised.
B. Coal fields.

II. Centers.
A. Odessa.
1. Exports.
One of the greatest wheat ports in the world; fish, lumber, oil, flour.
2. Imports.
Coal, tea, fruits, agricultural machinery, iron, steel, textiles, raw cotton.
3. Manufactures.
Flour, oil, sugar (refined), soap; tanning of leather.
B. Kief.
Linen, wool center.

Problem V. What does the loss of these provinces mean to Russia?

Russia loses:

1. Large number of people.
2. Large agricultural areas.
3. Extensive forests.
4. Industrial centers.
5. Ports.
6. Coal and iron fields.

China.

China holds an inferior position among the nations of the world because of the ancestor worship, the distrust of foreigners, and the weakness of government.

Problem. Why is China proper the most important province of China?

I. Locate the provinces of Manchuria, Mongolia, Sinkiang and Tibet. Describe their surface features and resources, and compare them with China proper.

II. Intensive study of China proper.

- A. Size — compare with the United States.
- B. Population.
  1. Compare with the United States.
  2. Compare with other provinces of China.
- C. Plains.
  1. Coastal plains.
  2. Flood plains.
  3. Products of the plains.
     Rice, tea, cotton, silk, bamboo, sugar, tobacco, hemp.
- D. Highlands.
  Use of terraces.
- E. Climate.
  Variety of climate.
  a. Temperature and rainfall favorable for growth of crops.
  b. Monsoons bring rain in growing season.
- F. Rivers.
  1. Names.
  2. Value for transportation.
  3. Use for irrigation.
  4. Importance in building plains.
  5. Connection by canal.
- G. Fish in rivers and along coast.
- H. Minerals.
  Coal, iron, petroleum, mercury.

I. Conclusion: China proper is the most important province of China.

1. Large agricultural lands.
2. Valuable unworked mineral deposits.
3. Is crossed by two important rivers.
4. Has favorable climate.
5. Many good harbors.
6. Abundance of cheap labor.

III. A few suggested problems.
1. Why may we expect China to grow in manufactures?
2. Why has not China been as progressive as Japan?
3. Why has China with its wonderful resources been a backward nation?
4. Why do other nations desire to control parts of China?
5. Why does China cling to Shantung?

IV. Cities.
Canton, Shanghai, Pekin, Hongkong, Tientsin, Hankow, Foochow.

JAPAN.

Japan is the greatest power in the Far East because her government and her people work so diligently and skillfully in every field of endeavor.

Problem. Why is Japan called the "Great Britain of the Far East"?

I. Island kingdom protected from invasion and near buying markets.
II. Area and population larger than Great Britain.
A. Densely populated country, desiring colonial expansion.
B. Intensive farming of foodstuffs.
III. Irregular coast line with good harbors.
A. Favors shipbuilding and large merchant marine.
B. Short transportation hauls between manufacturing cities and seaports.
IV. Resources.
A. Coal.
B. Short, swift rivers valuable for water power.
C. Climate.
Temperate. Humidity favorable for manufacturing cotton.
D. Accessible fishing grounds.
E. Energetic, progressive and skillful people.
V. Limitations.
A. Lack of available raw materials and sufficient foodstuffs.
B. Limited area to support dense population.
C. Surface in many places mountainous.
1. Not suited for agriculture.
2. Hinders development of transportation.
D. Support of large navy.
Great expense to poor people.
E. Japan also limited.
1. Government.
2. Religion and customs of people.
3. Poor labor laws.
4. Lack of sufficient capital.
VI. Cities of Japan — compare with those of Great Britain.
Tokyo, Yokohamo, Osaka, Kobe, Nagasaki.
VII. Additional problems.
1. Why does Japan desire more colonies?
2. May Japan hope to be industrially as great as England?
3. Of what value is Korea to Japan?
4. Why does Japan desire Shantung?
5. Why is Japan the only great world power in the Far East?
6. Why does Japan desire further control of China?

South America.

Interest in South America centers in her natural resources, which take the form of rich mineral deposits, extensive forests yielding a variety of products, and broad areas of land adapted to farming and stock raising and offering opportunities for settlement to the densely populated countries of Europe. None the less attractive are the opportunities afforded by the more progressive countries of South America to provide a market for the products of the manufacturing countries of the northern hemisphere.

Argentina.

Problem. Why has Argentina become one of the most progressive countries of South America?

I. Location.
  A. In temperate zone.
    1. Favorable for progress of energetic people.
    2. Attracts large immigration from Europe.
  B. On eastern side of South America.
    1. Long coast line with good harbors.
    2. Easy water routes to world markets.

II. Surface.
  A. Plains.
    1. Favorable for agriculture and grazing.
    2. Favorable for easy settlement of country.
    3. Favorable for building of railroads.
  B. Mountains.
    Served as natural boundary between Argentina and Chile.
  C. Large river system.
    Made farms of interior more accessible.

III. Climate.
  A. Variety of temperate climate.
    1. Favored development.
    2. Favored variety of products.
  B. Rainfall.
    1. In north central and east sufficient for Agriculture on very large farms.
    2. In south and west scant.
      Grazing on a large scale.

IV. Natural resources.
  A. Farms.
    Wheat, corn, flax, grapes, sugar cane, tobacco.
  B. Grazing lands.
    Sheep, cattle, horses.
  C. Mines.
    Silver, gold, copper.
  D. Forests.
    Northern forests for quebracho wood.

V. People.
  A. Nationalities.
    1. Early settlers Spanish.
    2. Very great Italian immigration one seventh of population.
    3. French, English and German capitalists.

B. Character.
1. Very progressive in schools, government, and development of Argentina.
2. Interested in A. B. C. alliance and international affairs.

VI. Transportation to and from rich hinterland.
A. Water routes.
1. Increased navigation on La Plata river.
a. Connects interior farms with coast.
b. Growth of Rosario and river cities.
2. Steamship routes to Europe and to United States.
a. Exports — wheat, corn, meat, wool, linseed oil, hides.
b. Imports — textiles, iron machinery.
c. Triangular voyages.
B. Land routes.
1. Increased railroad building.
Trans-Andine Railroad — west and trunk line north to Bolivia
2 Railroad centers — Buenos Aires, Rosario, Bahia, Blanca, Tucuman.

VII. Growth of cities.
Buenos Aires, La Plata, Rosario, Tucuman, Bahia, Blanca, Mendoza.

BRAZIL.

Problem I. Why has the large country of Brazil been slow in developing?

I. Location delayed development.
A. In southern hemisphere.
(In early times not easily accessible to world markets.)
B. In torrid zone (greater part.)
1. Climate very hot in most parts.
2. Excessive rain of Amazon region.

II. Surface delayed development.
A. Amazon plain a dense forest.
1. Prevented settlement.
2. Prevented railroad connection with interior.
B. Coastal plain very narrow.

III. Drainage delayed development.
A. Amazon river navigable but through tropical jungle.
1. Exploration and settlement checked.
2. Conditions not healthful.
B. Many rivers not navigable because of falls and rapids.

IV. Character of people.
A. Early settlers.
1. Portuguese settlers not enough to control country.
2. Importation of African settlers.
B. Government.
Unstable — hindered progress.

Problem II. What conditions are helpful to Brazil in its present and future development?

I. Location an advantage.

A. Aid in domestic commerce.
Almost all South American countries border Brazil.
B. Aid in foreign commerce.
1. Long coast line with good harbors.
2. Nearer European markets than Argentina or Chile.

II. Surface an advantage.
Eastern mountains low.
Short railroads now built from plantations to seaports.

III. Climate of south an advantage.
A. Temperate.
B. Healthful for white settlers.

IV. Natural resources.
A. Forests.
Rubber, cabinet and dye woods, vanilla.
B. Mines.
Gold, diamonds (very little coal and iron).
C. Farms.
Coffee, sugar, cotton, tobacco.
D. Grazing lands.
Hides and meat.
E. Waterfalls.
Source of power in future.

V. Number and character of later settlers.
A. Italian colony.
B. German colony.
C. Japanese.

VI. Increased transportation.
A. Water routes.
1. Increased navigation on Amazon.
Growth of Manaos as trading center.
2. Navigation on Paraguay river.
Connection with Buenos Aires.
3. Steamship routes to Europe and North America.
a. Exports — coffee, rubber, cacao, hides, tobacco.
b. Imports — foodstuffs, coal, machinery.
B. Land routes.
Railroads increasing.

VII. Growth of cities.
Rio de Janeiro, Para, Pernambuco, Bahia, Santos, Manaos.

CHILE.

Problem. Why is Chile a country of opportunities?

I. Location.
A. In temperate and torrid zones.
Extends so far north and south, therefore varied resources.
B. On western side of South America.
1. Direct connection with Pacific ports of United States.
2. Easy connection with Atlantic ports via Panama Canal.
3. Easy connection with European ports via Panama Canal.

II. Surface.
  A. Central valley.
    1. Favorable for farming of foodstuffs.
    2. Favorable for centers of population — Santiago.
    3. Favorable for building many connecting railroads.

III. Climate.
  A. Variety of climate.
    Favors variety of products.
  B. Rainfall.
    1. Of the north
      Never rains in Desert of Atacama.
        Therefore valuable nitrates never dissolved.
    2. Of the south.
      Much rain in central valley (Valley of Paradise).
        Very rich in varied products.
  C. Seasons.
    Chilian summers during winter in United States.
      Fresh fruits and vegetables sent to United States markets.

IV. Natural resources.
  A. Mines.
    Nitrates.
      1. Easily mined because of nearness to surface.
      2. Valuable asset because of world demand.
      Copper, gold, silver, coal, iron.
  B. Farms.
    Tropical fruits, sugar cane, cotton, rice, grapes, wheat, corn.
  C. Grazing lands.
    Cattle, sheep, goats.
  D. Forests.
    Lumber.
  E. Waters.
    Many waterfalls for waterpower.

V. People.
  A. Stock.
    Mostly Spanish with no intermarriage.
  B. Character.
    Energetic and progressive.
  C. Government.
    1. Character—strong republic.
    2. Government protection of nitrate.
      a. Large taxes on all exports of nitrate.
      b. Much revenue acquired, therefore Chileans exempt from many taxes.

VI. Transportation.
  A. Water routes.
    1. Steamship routes to United States and Europe.
      a. Exports—nitrates, copper, wool, hides, grain, tin, borax.
      b. Imports—textiles, machinery, clothing, furniture.
    2. Extensive improvements of harbors.
  B. Land routes.
    Increased railroad building.
      a. From Chile to Argentina.
      b. From coast ports to desert.
      c. Connecting cities in central valley.

VII. Advantages for manufacturing.
  A. Power.
    Waterfalls, coal.
  B. Raw materials.
    Lumber, wool, hides, grapes, nitrates.
  C. Markets.
    1. Domestic.
      Argentina—a farming country.
      Peru—a mining country.
    2. Foreign—United States and Europe.
  D. Transportation.
  E. Energetic people.

VIII. Growth of cities.
  Santiago, Valparaiso, Punta Arenas and nitrate ports of Iquique and Antofogasta.

United States.

The United States is a country remarkably rich in natural resources, which render it independent in large measure of other countries. Yet because of the needs arising from the development of its natural resources and the many products resulting from such development, the United States has varied and important relations with every part of the civilized world.

World Relations of the United States.

I. Natural resources.
  Areas suitable for agriculture and grazing, fish in inland waters and bordering oceans, forest waterways, water power, mineral deposits, good natural harbors.
  Compare resources with those of other countries, such as Great Britain, Germany and the countries of South America.
  Development of resources.
    Compare development of resources and value of chief products with those of other countries.
  Character of people.
  Immigration.
  Great industries and centers resulting.

II. Contributions to other countries.
Chief commercial products.
Areas and centers of production.
Countries to which sent.
III. Dependence upon other countries.
Nature of products received.
Conditions making importation of each necessary.
Countries supplying them.
IV. Methods of transportation.
Trade routes and commercial centers.

Minimum List of Cities.

As a result of the work of this grade, pupils should possess a knowledge of the significance and the accurate location of each of the following cities:

I. Those listed for Grade VII.
II. Additional cities.

a) Of the United States.

Atlanta.	Erie.	Newark.
Charleston.	Indianapolis.	Savannah.

(*b*) Of North America.

Toronto.	Winnipeg.

(*c*) Of other countries.

Alexandria.	Hong Kong.	Paris.
Antwerp.	Honolulu.	Pekin.
Belfast.	La Plata.	Petrograd.
Berlin.	Liverpool.	Rio de Janeiro.
Bordeaux.	London.	Rome.
Bremen.	Lyon.	Rosario.
Buenos Aires.	Manchester.	Rotterdam.
Calcutta.	Marseille.	Santiago.
Canton.	Melbourne.	Santos.
Colon.	Milan.	Shanghai.
Constantinople.	Moscow.	Tokio.
Genoa.	Naples.	Venice.
Glasgow.	Odessa.	Vienna.
Hamburg.	Panama.	Yohohama.
Havre.	Para.	

Part II.

I. Suggestions For Teaching.

It is suggested that the Unites States and South America be studied in the latter part of the year in order that the first work of the eighth year may not appear to be a repetition of that of the seventh year. It is also thought that by studying the United States last its many important relations may be more fully shown.

Since this course aims to emphasize international relationships and to impress upon the mind of the pupil the importance of those products, industries and influences which give to each country or region its standing among the nations of the world, it would be well to avoid the consideration

of the countries from a purely regional standpoint as is done in the sixth and seventh grades, and thus avoid a seeming repetition of the work of earlier years.

It is expected that the colonies will be studied in connection with the mother country, as is indicated in the outline for the study of Great Britain. Each of the chief commodities of commerce, or an important commodity of commerce, may well be studied in detail in connection with a region noted for its production or manufacture. For instance, coffee would naturally be treated at length when studying South America; cotton when taking up the United States; and silk when dealing with the Orient or southern Europe.

The work of this grade should be vitalized.

By the use of the problem method whenever the teacher finds that this method can be used to advantage.

By the use of pictures of all kinds.

By the use of folders advertising railroad and steamship lines.

By the use of illustrative material.

Collected by the school.

Collected by the pupils.

By the use of outline maps for locating areas of production, routes of transportation and important industrial and commercial cities.

By the use of unlettered outline maps pupils should gain a knowledge of the location of states and also the location of the more important physical features, such as the great lakes and the larger rivers.

Cities like Chicago and Duluth should be located by associating them with their respective states and with any larger water body on which they are located.

By the use of statistics, particularly in the form of graphs.

By the use of current events as reported in newspapers, magazines, and in the commerce reports.

Problem work is particularly valuable when based upon or closely associated with matters of present day interest.

By relating the work to the pupils' experiences as fully as possible.

By visits to wharves, freight sheds, mills and factories.

By the assignment of special subjects to individuals or groups for study and report.

By showing constantly the relation of each region to the United States, to New England and to Boston.

II. Books for Text and Reference.

Text-books for Children.

Brigham and McFarlane's Essentials of Geography, Book Two.
Frye and Atwood's New Geography, Book Two.
McMurry and Parkin's Advanced Geography, Book Two.
Smith's Human Geography, Book Two.

Reference Books for Children.

Allen's Europe, Asia, South America, United States.
Bishop and Keller's Industry and Trade.

Carpenter's Europe, Asia, South America.
Carpenter's How The World Is Fed.
Carpenter's How The World Is Clothed.
Carpenter's How The World Is Housed.
Dryer's Elementary Economic Geography.
Hubertson's Asia.
Huntington's Asia.
Keller and Bishop's Commercial and Industrial Geography.
Rochaleau's Commerce and Industry.
Rochaleau's Great American Industries.
Southworth and Kramer's Great Cities of the United States.
Winslow's United States.
Winslow's Our American Neighbors.

Reference Books for Teachers.

Atwood and Thomas' Teaching the New Geography.
Branom's The Teaching of Geography.
Brigham's Geographic Influences on American History.
Brigham and McFarlane's Manual for Teachers.
Bowman's South America.
Bowman's The New World.
Chamberlain's Geography, Physical, Economic and Regional.
Chisholm's Handbook of Commercial Geography.
Colby's Source Book for Economic Geography of North America.
Cram's Universal Atlas.
Fisher's Resources and Industries of the United States.
Gannett, Garrison and Houston's Commercial Geography.
Huntington and Cushing's Principles of Human Geography.
Semple's Influence of Geographic Environment.
E. E. Smith's Teaching Geography by Problems.
J. R. Smith's Industrial and Commercial Geography.
J. R. Smith's Industry and Commerce.
J. R. Smith's World's Food Resources.
Sutherland's Teaching of Geography.
Sutherland and Sanford's Practical Exercises in Geography.
Trotter's Geography of Commerce.
Winton's Complete Atlas.
The World Almanac.
Statesman's Yearbook.

SCHOOL DOCUMENT NO. 12.—1922

BOSTON PUBLIC SCHOOLS

ANNUAL REPORT OF THE SUPERINTENDENT

OCTOBER, 1922

BOSTON
PRINTING DEPARTMENT
1922

Boston, October 16, 1922.

To the School Committee of Boston:

I submit herewith the fortieth annual report of the Superintendent of Public Schools.

Respectfully submitted,

JEREMIAH E. BURKE,

Superintendent of Public Schools.

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GROUP OF 320 CHILDREN WITH FORSYTH CERTIFICATES, EACH CERTIFICATE REPRESENTING 124 CHILDREN TOTALING 39,680 WITH "ALL DENTAL WORK COMPLETED" IN BOSTON PUBLIC SCHOOLS FOR THE YEAR 1922

ANNUAL REPORT OF THE SUPERINTENDENT OF SCHOOLS

ANNUAL REPORT OF THE SUPERINTENDENT OF SCHOOLS.

Democracy and Education.

The Rights of Children: We hear much in these later days about the rights of men—and of women—and all this is hopeful and commendable. But there are still too few to proclaim the rights of children. And yet, children as well as adults possess rights, inalienable and irrevocable.

It is the right of children and youth to grow and develop; to acquire correct habits, physical, intellectual and spiritual; and under the most competent guidance to be educated to the highest possible extent compatible with their capacities and endowments; to the end that as individuals and as members of society they may occupy those stations in life for which they are best qualified by nature and by training, and that therein they may discharge duties, perform services, and enjoy the blessings of liberty, more abundantly than they could in any other place or sphere in life.

Physical Habits: By the cultivation of correct physical habits one prepares for individual service. He thereby becomes capable of performing well his daily tasks; he may secure promotion or preferment; he experiences the bounding joy of health; he is cheerful and optimistic; he enjoys life and the pursuit of legitimate happiness. "Give us, oh, give us," says Carlyle, "the man who sings at his work."

Likewise one becomes the better equipped for patriotic service. Vitality is a national asset; conservation of health is a national responsibility. Courage to dare and power to do are essentials of personal security and of national stability. A nation must have strong men in days of peace as well as in times of strife. There must always be brave mothers of heroic sons and daughters.

Battlefields are often won upon playgrounds. Here is treasured up that splendid reserve power—those Blücher forces—so indispensable to all great achievements, moral as well as physical.

Finally and chiefly there is a spiritual reason for the formation of proper physical habits. The body is the tabernacle of the soul, and as such should be made a worthy habitation for the indwelling of an immortal spirit.

Intellectual habits are developed in order that the individual may possess clarity of thought; that he may think straight; that he may have intellectual and moral courage; that he may form his own opinions and convictions; that he may think dispassionately and arrive at independent conclusions; that he may acquire the power of suspended judgment; that he may distinguish with judicial candor between the true and the false, between the spurious and the genuine; that he may become a seeker after truth, truth in its moral loveliness—and the truth shall make him free!

Spiritual Habits: Ideas rule the world, but ideas must be inspired by ideals. Things of the mind are infinitely more to be treasured than things that are material. Likewise, the spiritual transcends the purely intellectual.

We are committed in this country because of the composite character of our people to the maintenance and support of a system of non-sectarian public schools. This implies that within these school rooms there shall be permitted no partisan, racial or religious propaganda; that there shall not be introduced the tenets of any political party, or of any creed, or of any race. These exclusions, however, must not preclude the development of spiritual habits—the inculcation of great cardinal virtues such as obedience, industry, sobriety, thrift, probity, integrity, reliability, straightforwardness, trustworthiness, incorruptibility.

Indeed, the Statute Law of Massachusetts is mandatory and unequivocal in its insistence upon moral training in our schools. It reads as follows:

"The president, professors and tutors of the university at Cambridge and of the several colleges, all preceptors and teachers of academies and all other instructors of youth shall exert their best endeavors to impress on the minds of children and youth committed to their care and instruction the principles of piety and justice and a sacred regard for truth, love of their country, humanity and universal benevolence, sobriety, industry and frugality, chastity, moderation and temperance, and those other virtues which are the ornament of human society and the basis upon which a republican constitution is founded; and they shall endeavor to lead their pupils, as their ages and capacities will admit, into a clear understanding of the tendency of the above mentioned virtues to preserve and perfect a republican constitution and secure the blessings of liberty as well as to promote their future happiness, and also to point out to them the evil tendency of the opposite vices."

It is, therefore, the child's right—it is his educational heritage—to possess these virtues as a touchstone to which all his

thoughts and all his actions may be subjected. If he has these qualities deeply imbedded in his heart, if he possesses them as a vital part of his very being, then he may err for a time and wander far afield, but drawn back inevitably will he be by an irresistible impulse, by a centripetal force, back to safe spiritual anchorage. Controlled by these great spiritual influences, the private life of the individual will be safe-guarded and his civic conduct assured. The welfare of the child and the welfare of society, therefore, equally demand the cultivation of these moral and spiritual virtues.

But these physical, intellectual and moral qualities are not acquired overnight. They do not come in a morning dream. They do not fall into one's idle lap like windfalls from the clouds. They are the result of exercise continuously and persistently repeated and finally becoming automatic, habitual and reflexive. There needs to be incessant training in health culture, in right thinking and in moral purpose at every step in the child's career, from early childhood through adolescence into youth. Complete and symmetrical education, which is the birthright of every American, requires a long probationary period. It imperatively demands that all boys and girls remain in school and under the influence of highly competent instructors until they are at least sixteen years of age, with a part-time attendance upon some sort of extension or continuation school for at least two years thereafter. Thus there would be maintained an impersonal and a legally sanctioned stewardship over children and youths to protect, defend and direct them during the impressionable years of their minority, wherever they may be found, whether at work or at play, whether within or without the schoolroom.

Denial of this privilege is to defraud children and youths of their indisputable educational heritage. It is to deprive Democracy of the fulfillment of its destiny.

Universal Education: "And also point out the evil tendency of the opposite vices," urges the statute on moral instruction. It is insufficient that good habits be inculcated; vicious habits must be inhibited. Gladstone in the beautiful essay which he wrote on his dear friend, Henry Hallam, the subject of Tennyson's "In Memoriam," gives expression to an idea which hitches in one's mind. Gladstone among other things says that the progress of the nineteenth century is expressed by two simple words,—"Unhand me."

These two words, "unhand me" tell the whole story about education. Education—"unhand me"—means the removal, so far as possible, of all obstacles, restraints, impediments, whether they be physical, intellectual or spiritual, in order that free, untrammeled, all handicaps removed, I may work out my complete destiny—temporal and eternal; that as an individual I may enjoy the blessings of life, liberty and the pursuit of happiness and that, moreover, as a citizen, I may become socially competent—a self-respecting, self-supporting co-worker with my fellows in the life of community and Commonwealth.

Nature is not lavish in the distribution of her gifts. Nature revels in variability and diversity. One person has beauty of form, another brilliancy of intellect, a third magnanimity of soul. Rarely are all these gifts the possession of any single individual. Nature is inhospitable of the superman; she is prodigal of the average of the species. "God must love the common people," sagely remarked the incomparable Lincoln, "He creates so many of them."

There are radical differences in the qualities that go to make up the so-called normal child. Humanely and sanely these differences and peculiarities are becoming recognized in the life of the school. In place of rigid and uniform courses of study, curricula are being modified and reconstructed to satisfy the varying aptitudes and capacities of boys and girls, of groups of children, all equally deserving, all endowed with equality of rights and entitled to equality of opportunity.

Any discussion of plans and purposes is incomplete which fails to emphasize the two-fold objective of education. Popular education subserves a two-fold purpose: It should enable every boy and every girl—yes, every man and every woman—to rise to the very heights of his capabilities and endowments; and then, to become a citizen of power in the service of the Commonwealth. There must be provided in a democracy freely and fully equality of opportunity for personal improvement and success. But that is only one side of the shield. Running through all systems of education—like the ichor that coursed through the veins of the gods—must be the throbbing impulse of *service*. Equal opportunity must be afforded every boy and every girl to develop to the very utmost all his capacities and endowments; but when this is realized, when these heights are attained, then he or she in all humility and gratitude should dedicate all achievements and successes not to self-

glorification or self-aggrandizement, but rather to the service of fellow-men and the welfare of country. There should come into the lives of our future American citizens the exalted spirit of the craftsmen of the Middle Ages whose souls were in their tasks. And whatever they constructed—whether it were a simple product of metal from the locksmith, or the cathedral of many architects with its myriads of spires—everything they did was for the service of their fellowmen, and for the glory of God.

All this implies that nation, state, city, town—all must unite in furnishing unlimited educational, recreational and vocational facilities for our children and our youths. In addition to elementary and secondary instruction there must be provided generously normal schools and colleges; junior colleges; state universities; part-time schools; continuation schools; industrial, prevocational and vocational schools; agricultural schools; textile schools; evening schools; Americanization classes; extension and collegiate courses, to meet the recurrent personal needs of innumerable groups of young people. We must popularize the school. We must make it attractive. We must place it directly in the pathways of our boys and girls, as so many ladders whereby they may climb upward and onward.

An ambitious and expensive program, I hear you protest. My reply is this: Democracy is expensive. It has been secured through infinite toil and sacrifice. It has cost the world its best blood and treasure. Our greatest national assets are first, education—free, universal education; and, second, its resultant—the highest possible degree of personal, civic and national intelligence and righteousness.

On the other hand, Democracy's greatest national liability is ignorance. Parsimony in education means bankruptcy. In education we must spend freely that we may save. Education is more than insurance. It is our assurance against tomorrow's ills. Intelligent citizenship is the future's hope. Let us not forget. And let us be unyielding and insistent about the super-eminence of education in a democracy.

Contemplate for one moment the cost of the world's great war. We are told that in round numbers the war cost the nations three hundred billion dollars. Take all the wealth of these United States, realty and personalty of every conceivable kind, and roll it all up into one great mass and you

will find it estimated at about three hundred billion dollars. Without mentioning the ineffable loss of human lives, *horresco referens*, the expense of the great war was commensurate with the property value of our entire country. And never forget this: *The war was caused by the materialistic philosophy and the false education of the leaders of the German people.*

And realize, further, that all property, whether personal or real, is worthless unless the people's will has been properly trained to respect and safeguard it in days of stress and storm.

Years ago in the Senate of the United States, while championing the cause of Greece and pleading for her independence, Henry Clay, quoting from the eternal law exclaimed, " 'What shall it profit a man if he gain the whole world and suffer the loss of his own soul,' Or what shall it avail a nation to save the whole of a miserable trade and lose its liberties." We must save our soul at any cost. The soul of this nation is ideal education. Let us guard it as something sacred. Material things must pass away—the soul is for immortality. Our heritage is sublime!

Reorganization of the Boston Normal School.

I. At Present.

Students: During the past year 302 students have been in attendance at the Boston Normal School. In the first year class there were 104 students, in the second year class 94, and in the third year class 75. Of this number, 40 students were preparing for service in kindergarten-primary grades, and 233 for service in the first six grades of the elementary school. Twenty-nine students were enrolled in the college section which will be described later.

Courses of Study: Heretofore two courses of study have been offered in the Boston Normal School, namely, a course for kindergarten-primary teachers and a course for teachers of the first six grades of the elementary schools. Each course is three years in length. The course preparing teachers for elementary grades is as follows:

Elementary Course (Three Years).

First Year.	Periods per week
Educational Psychology (college)	3
English Composition (college)	4
Principles of Education	5
Elementary Science	3
Oral Expression	1
Penmanship	2
Subjects not requiring outside study:	
Drawing and Manual Training	2
Choral Practice	1
Gymnasium	2
Observation	2

Second Year.	
Principles of Elementary Education (college)	2
Hygiene (college)	3
Geography (college)	4
Mathematics (college)	4
English	3
Oral Expression	1
Music	1
Subjects not requiring outside study:	
Drawing and Manual Training	2
Choral Practice	1
Gymnasium	2

Third Year.	
One-half year devoted to practice teaching.	
One-half year devoted to Normal School Instruction as follows:	
English Literature (college)	4
History	6
History of Elementary Education	3
Geography (one-half semester)	4
Science (one-half semester)	4
Mathematics	2
Drawing and Manual Training	2
Hygiene	1
Music	1
Gymnasium	2

Work of College Grade: Each subject listed in the above course of study, followed by the word "College" in parenthesis, both in content of subject matter and in quality and methods of instruction, has been approved by the Harvard Administrative Board for University Extension and is creditable toward the degree of Associate in Arts. The Boston Normal School,

therefore, is doing college work for which students may receive 7 of the 17 credits required for a degree of Associate in Arts at Radcliffe College. Similarly, graduates of the Boston Normal School may receive 66 points towards the 120 required for the degree of Bachelor of Science in Education at Boston University. Also, graduates of the Boston Normal School may receive two years' credit toward the degree of Bachelor of Science at Simmons College. It is evident, therefore, that the Boston Normal School is now doing a substantial amount of work of college grade. It has been doing this for nearly ten years, and therefore the work is in no sense to be regarded as experimental. The capability of the school to do college work is assured.

Equipment: The Normal School is located in the group of buildings known as the Normal Group, on Huntington Avenue. This group comprises the Normal School, the Patrick A. Collins building now used as an annex by the English High School, and the Girls' Latin School. The Normal School is equipped with laboratories suitable for work of college grade in Biology, Zoology and Botany. With slight alterations, the building may be equipped for college work in Physics and Chemistry. It has a splendid hall and an exceptionally fine gymnasium. It is provided with all modern facilities. It can accommodate about three hundred fifty students. This number could be increased to six hundred, and perhaps more, by using the Patrick A. Collins building which was originally designed for a practice school. This group of buildings was erected in the year 1907, at a cost of $796,100; $753,000 for construction and $43,100 for equipment.

Cost of Maintenance: The school is maintained wholly by the City of Boston at an annual expense of approximately $68,000, including cost of instruction, salaries, etc.

Admission to Normal School: Young women who have satisfactorily completed the prescribed Normal School preparatory course in a Boston day high school, or an equivalent course of study with diploma elsewhere, are eligible to take the examinations for admission to the school. These examinations are held annually under the direction of the Board of Superintendents. It is required that the preparatory course for admission to the Normal School shall include

(*a*) Four years of English; at least 14 points.

(*b*) Four years of a foreign language; at least 16 points. (The four years of foreign language study should be devoted to a single language. Two languages may be offered only with the approval of the Board of Superintendents.)

(*c*) Two years of mathematics (algebra and plane geometry); at least 8 points.

(*d*) Two years of history, including United States History under the Constitution; at least 7 points.

(*e*) One year of science (physics or chemistry); at least 4 points.

All candidates are required to present certificates showing that they have pursued the prescribed course. No examination is required of graduates of Boston public high schools in any of the above prescribed subjects, (*a*) to (*e*) inclusive, when a grade of A or B is certified. Examination is required in each of the prescribed subjects in which the grade certified is C or lower.

No examination is required of candidates from other than Boston public high schools in the prescribed subjects in the *first three years* of the course when a grade of 75 per cent. or better is certified.

All candidates from other than Boston public high schools are examined in each of the prescribed subjects of the *fourth* year of the Normal Preparatory Course.

If, therefore, a candidate fails to receive an honor mark, *i.e.*, A or B, in any subject, she is obliged to pass a satisfactory examination in that subject. Thus, the standard of admission to the Boston Normal School is quite on a parallel with that for admission to colleges. From the above, it is apparent that candidates applying for admission to this school must have pursued courses of study equivalent to those required for admission to college.

High School Preparatory Course of Study for the Normal School.

The following preparatory course for high school pupils who purpose applying for admission to the Boston Normal School was adopted by the School Committee June 28, 1917:

(One point represents the value of work done at passing grade in a subject having prepared recitations once a week throughout a school year; two points represent two prepared recitations per week throughout a school year, etc.; 80 points* are required for a diploma.)

FIRST YEAR.

Subjects.	Points.*
English I.	4 or 5
Foreign Language I.	4 or 5
Mathematics I. (Algebra *or* Geometry)	4 or 5
History I.	3
Hygiene	1
Physical Training I.	2
Choral Practice I.	1
	19 to 22

SECOND YEAR.

English II.	4 or 5
Foreign Language II.	4 or 5
Mathematics II. (Algebra *or* Geomtery)	4
Biology (Optional)	3 or 4
Drawing I. (Optional)	3
Physical Training II.	2
Choral Practice II.	1
	21 to 24

THIRD YEAR.

English III.	3 or 4 or 5
Foreign Language III.	4 or 5
Drawing II. (Optional)	3
Physics *or* Chemistry†	4
Physical Training III.	2
Choral Practice III.	1
	17 to 20

FOURTH YEAR.

English IV.	3 or 4 or 5
Foreign Language IV.	3 or 4 or 5
United States History under the Constitution	4
Chemistry *or* Physics†	4
Physical Training IV.	2
	16 to 20

*These requirements will be somewhat modified when the 100-point diploma plan becomes fully operative.

†One year's work in either subject.

II. What is Proposed.

The Courses: The coming of Intermediate or Junior High Schools in Boston has brought about the following organizational sub-divisions of the system, which are recognized in all the instructional phases of education as well as in all provisions for the construction of new buildings. These units are (*a*) the kindergarten, (*b*) the six-grade school, (*c*) the intermediate school (Grades VII, VIII and IX) and (*d*) the higher secondary grades (Grades X, XI and XII).

In the past, the Boston Normal School has provided excellent training for prospective teachers of the kindergarten and of the first six elementary grades. The establishment of intermediate (or junior high) schools in Boston (Grades VII, VIII and IX) calls for another type of teachers for which no provision has been made in the local Normal School. Teachers in these grades have been qualifying for their new responsibilities by means of the various promotional and improvement courses offered by the Board of Superintendents. In the opinion of the School Committee, the work of students preparing to become intermediate grade teachers should be of college standard. The School Committee accordingly petitioned the General Court at its last session and received authority to confer college degrees in the Normal School. The Act granting this privilege reads as follows:

> "The School Committee of the city of Boston may grant the degree of bachelor of education or of bachelor of science in education to graduates of the Boston Normal School who have satisfactorily completed a four years' course of instruction in the Boston Normal School as prescribed by the Board of Superintendents."

It is proposed, therefore, to establish in the Boston Normal school upon the opening of the school in September, 1922, a suitable course for the training of intermediate grade teachers. This course should be broader and richer than that provided for elementary grade teachers and in some respects should differ from that for higher secondary grade teachers. It is proposed that students preparing for service in intermediate (or junior high) schools shall be required to pursue a four-year college course and that, on the successful completion of this course, they shall receive the degree of Bachelor of Education.

Manifestly the weakest link in our educational chain is the failure to provide adequately for the training of higher second-

ary grade teachers. For some time the Boston School Committee has been overcoming this serious defect in the following manner: Graduates of approved colleges, who satisfactorily pass an examination prescribed by the Board of Superintendents, are admitted to the Boston Normal School for a year of graduate work. These candidates take a semester of practice-training under the direction of the Board of Superintendents and under the supervision of the Department of Practice and Training; and a second semester of strictly academic instruction in either Boston College or Boston University, as the individual students may elect. Having successfully completed this year of graduate instruction, these students are awarded the degree of Master in Education by the colleges which they have attended. They are then eligible for examination for the position of junior assistant (a probationary appointment) in the secondary schools of Boston and, after further successful experience, may qualify as a regular high school teacher. By the inauguration of this plan, the Boston School Committee has been anticipating the time when the eligibility requirements for service in its higher grade schools will include a master's degree.

In preparation for this year of graduate work, the School Committee now purposes to establish in the Boston normal school a four-year course that shall be of standard college grade in every particular. Graduates of this course shall receive the degree of Bachelor of Science in Education. Upon completion of the course, students will take an additional year at one of the colleges or universities, and secure their master's degree.

In organizational plans, and more especially in salary schedules for teachers there still exists in Boston a distinction between the intermediate grades (VII, VIII and IX) and the higher secondary grades (X, XI and XII). For the immediate future, therefore, it is desirable that the preparation of teachers for service in the two types of schools should differ. Students receiving the degree of Bachelor of Education will be qualified immediately for service in intermediate grades. Students receiving the degree of Bachelor of Science in Education, however, will be required to do at least a year's additional graduate work and secure a mastership. The academic work in the course leading to the degree of Bachelor of Science in Education will be more extensive than that in the course leading to the degree of Bachelor of Education. The course leading to the degree of

Bachelor of Education will include during the third year an entire semester of practice work in the schools of Boston. This is imperative because on graduation they may immediately qualify for service. This practice work will be omitted from the bachelor of science course but will become an essential and integral part of the students' graduate work.

New Courses of Study: The present three-year kindergarten course in the Normal School will be continued; likewise, the three-year elementary course already described in detail. All the present subjects of the elementary course that receive college credit will be retained, and other subjects of similar grade will be added from time to time. All work accomplished by the students will be evaluated in terms of college credits, so that graduates of the three-years' course may subsequent to graduation build up additional points required for one of the degrees.

The college courses will include a rather lengthy range of subjects, both majors and minors, from which elections may be made, such as, English, History, Latin, French, Spanish, Mathematics, Biology, Zoology, Botany, History of Education, Philosophy of Education, Health Education, Psychology, etc. The following provisional courses of study have been approved for the first two years:

PROVISIONAL COURSES OF STUDY IN THE BOSTON NORMAL SCHOOL, LEADING TO THE DEGREE OF BACHELOR OF EDUCATION AND OF BACHELOR OF SCIENCE IN EDUCATION.

COURSE FOR THE DEGREE OF BACHELOR OF EDUCATION.

	Periods per week.
FIRST YEAR.	
Education I.	4
English I.	4
Mathematics I. or History I.	4
Biology or Foreign Language I. or Drawing and Manual Training I	4
Art Appreciation	2
Gymnasium	2
SECOND YEAR.	
Education II.	4
English II.	4
Mathematics II or Geography I.	4
Hygiene or Foreign Language II or Drawing and Manual Training II.	4
Music Appreciation	2
Gymnasium	2

Course for the Degree of Bachelor of Science in Education.

First Year.

Education I.	4
English I.	4
Mathematics I or History I	4
Biology or Foreign Language I	4
Gymnasium	2

Second Year.

Education II	4
English and American Literature	4
Mathematics II or History II.	4
Hygiene or Foreign Language II.	4
Gymnasium	2

The courses for the third and fourth years are in process of construction, but have not yet been formally adopted.

III. An Educational Center.

The degree-bearing courses at the Normal School will not be restricted to the regular students. They will be offered eventually to all the teachers of the city. The School Committee of Boston requires all teachers within a limited time after entering the service to take promotional examinations. Likewise, in the promotion of teachers to supervisory or administrative positions, it demands evidence of professional improvement and growth, including the satisfactory pursuit of college courses. Having made these requirements, the School Committee consistently is anxious to establish agencies whereby teachers may pursue required courses and thus meet these professional demands. This desire of the Committee will be fulfilled by having a degree granting institution of its own. A surprisingly large number of Boston public school teachers are enrolled as students in our numerous local colleges and universities. The School Committee contemplates making such an instrument of service out of the Boston Normal School. When these college courses have become well established the School Committee hopes to be able to organize Saturday morning courses, late afternoon courses and summer courses free to the teachers of the city who are seeking professional im-

provement. Teachers taking these various courses will receive college credit therefor and thus in time, if they so desire, they may secure a college degree or, having obtained one degree, by continued study they may win a higher one. Thus, the Boston Normal school will become a veritable educational center for the city, not only providing a thorough preparatory training for teachers of all school grades, but also affording a splendid opportunity for professional development continuous throughout all the years of service. From it will radiate an inspiration that will influence the great majority of teachers and affect with enduring beneficence the entire school system.

The reorganization of the Boston Normal School as approved by the School Committee may be summarized as follows:

1. A three years' course preparing teachers for service in kindergarten and primary grades, and a three years' course for teachers of elementary schools. (Both courses contain a certain amount of college work.)

2. A four years' course of college grade which, immediately upon its completion, qualifies teachers for service in intermediate (or junior high) schools (Grades VII, VIII, IX). Students completing this course will receive the degree of Bachelor of Education.

3. A four years' course, more extensive and intensive than that mentioned in "2" preparing directly for graduate work in schools of education, and leading to a Mastership in education; the latter degree to be included among the eligibility requirements for service in higher secondary grades (Grades X, XI and XII). Students successfully completing this course will receive the degree of Bachelor of Science in Education.

4. Readjustments at the Boston Normal School of such a character as to make it an educational center for the city, offering courses throughout the year to various groups of teachers who are satisfying promotional requirements or seeking credits toward a college degree.

The following outline indicates briefly the courses of study to be offered at the Boston Normal School in September, 1922, and the grades of school service for which the various courses may qualify or toward which they may lead:

Name of Course.	Completion of Course Qualifies for:
I. A three years' kindergarten-primary course.	1. Service in kindergartens and in Grades I–III, inclusive.
II. A three years' elementary course.	1. Service in Grades I–VI, inclusive.

III. A four years' college course.

a. With degree of Bachelor of Education.

1. Service in Grades I–VI, inclusive.
2. Temporary service under Junior Assistant Intermediate Certificate which qualifies for temporary service in Grades VII–IX, inclusive, salary being same as first steps in the schedule for elementary school teachers.
3. After one year of temporary service under the Junior Assistant Intermediate Certificate, candidate may qualify for regular Intermediate certificate (Grades VII–IX, inclusive, of intermediate schools and classes).

b. With degree of Bachelor of Science in Education.

1. Temporary service under Junior Assistant Intermediate Certificate which qualifies for temporary service in Grades VII–IX, inclusive, salary being same as first steps in the schedule for elementary school teachers.
2. For one year's graduate university work leading to the degree of Master in Education.
3. The degree of Master in Education qualifies for examination for the Junior Assistant High School Certificate.
4. The Junior Assistant High School Certificate qualifies for temporary service in Grades VII–XII, inclusive, of intermediate schools and classes and high schools, the salary being the same as at present for Junior Assistants.
5. After one year's service under the Junior Assistant High School Certificate, candidate may qualify for regular High School Certificate. (Grades IX–XII inclusive).

The Evolution of the Merit System.

Appointment by Merit: It would be difficult to indicate the particular stage in the development of the public school system where appointment by merit had its origin. Doubtless it is safe to assert that at no time in the history of our schools has merit been intentionally disregarded in making appointments. Occasionally, candidates with meagre educational equipment entered the service, but the invariably high character of the teaching corps is conclusive proof that the number of incompetent teachers was always relatively small. It is quite likely that the first direct step toward appointment of teachers on merit was made when the School Committee was re-organized in 1876. In January of that year the School Committee, which the previous year had been reduced by legislative enactment from seventy-six to twenty-four members, entered upon its new duties. The two most noteworthy features of this re-organization were the transfer to the Superintendent of Schools of certain executive functions previously exercised by the School Committee, and the establishment of the Board of Supervisors. The School Committee in its annual report for the year 1876 discussed the duties of the Board of Supervisors in the following words:

"The appointment of teachers nominated for election in the School Board, without careful consideration of their qualifications, was an evil which had begun to show its disastrous effects by unmistakable signs. Personal solicitations, motives of self-interest, kind-heartedness, a dislike to say No, when it conflicted with the charitable desire to give a needy, though perhaps incompetent aspirant a means of livelihood, had led many members of the School Board to obtain teachers' places for unfit persons, and the soundness of the schools was thus in process of becoming gradually but gravely compromised. It was only through the examination of candidates by competent persons, whose certificates could be depended upon as proofs of proper qualification, that this evil could be checked. That the conduct of examinations was felt to be one of the most important functions of the Supervisors is proved by the fact that at first it was proposed to give them the title of examiners. They were meant to attend especially to the securing of competent teachers by means of examinations, by inspection of the schools, and by the holding of biennial examinations of the scholars to test the fitness of the teachers to impart knowledge."

In an address to the principals of schools in 1877, Mr. John D. Philbrick, Superintendent of Schools, had this to say upon the same subject:

"Provision has at length been made for remedying this defect in our system by the appointment of officers [the Board of Supervisors] charged with the duty of examining teachers. You will welcome this improvement, I doubt not; for if there has been any one thing on which I have found you agreed, it has been in the earnest desire to secure for the schools under your charge the very best teachers to be had."

The creation of the Board of Supervisors and the transfer from the School Committee to this Board of the power of examination and certification of teachers made more difficult the admission into the service of incompetent candidates and to a corresponding degree increased the likelihood of appointment of deserving candidates. However, nominations of teachers continued to be made by division committees of the School Committee, and Section 82, Chapter 7, of the Rules of the School Committee for the year 1877 reads as follows:

"At the annual meeting for the election of instructors, which shall be held with closed doors, the committees on nominations shall report upon the several lists of candidates returned to them by the normal, high school, and division committees."

This secret session for the election of teachers evidently proved unpopular, because three years later (1880) the rules of the School Committee were amended by striking out the objectionable words, "which shall be held with closed doors."

The year following (1881) there appears in the rules and regulations for the first time official recognition of expert assistance in the selection of teachers. Section 149 of the regulations, as amended, reads as follows:

"The Board of Supervisors shall revise, at least once a year, the list of certificated teachers who are available for service. It shall strike therefrom the names of those who, after a fair trial and careful investigation, are found to be incompetent teachers. For the use of the Board [School Committee] and the committees thereof, a classification shall be made of those persons whose names remain on the list, according to their excellence and their probable fitness for certain positions."

In 1906 the School Committee again was re-organized. The membership was reduced from twenty-four to five. All subcommittees were abolished, and since that time the Board has conducted all business as a committee of the whole. All appointments were vested by the School Committee in the Superintendent of Schools; and the subsequent year by action of the Legislature the Board of Supervisors became the Board of Superintendents. The hour had come for reconstruction

of the school system along progressive lines, and the newly-elected superintendent of schools, Mr. Brooks, arose to the emergency. Acting upon his advice, the Board of Supervisors submitted to the School Committee a comprehensive plan with respect to the examination, certification, appointment and promotion of teachers. This plan provided that examinations of candidates for appointment as teachers in the public schools should be conducted at intervals by the Board of Supervisors; that these examinations should test the training, knowledge, aptness for teaching, and character of candidates; that the Board of Supervisors should grant certificates of qualification to persons successfully passing the examinations; and that the names of those successfully passing such examinations should be arranged by the Board of Supervisors in the order of their respective qualifications as determined by such examination. The recommendations with slight modification were adopted, and in the Regulations the School Committee unqualifiedly endorsed the merit system as follows:

"SECTION 127. Except in cases of promotion or transfer, or of appointment as principal of a school or district, or as director of a special subject, no person shall, after September 1, 1906, be appointed to teach in the public schools whose name does not appear among the highest three of the names on the proper eligible list willing to accept such appointments."

Mr. Brooks in his annual report for 1906 discusses the advantage of the merit system, and says:

"The second piece of legislation, designed to secure the entrance into the service of only the ablest teachers, is the adoption of a civil service system of appointment. This is by far the most important item of the recent legislation and the one that will most benefit the schools.

"Of its advantage to the Boston schools when applied to candidates coming from outside, there can be no question. Obviously we should choose the best. It is the purpose of the merit system of appointment to set carefully and deliberately about determining who is best; to use for this purpose those who are most familiar with the needs of the schools and are therefore best fitted to judge of the qualifications of candidates; to substitute the combined, deliberate, and impartial decision of the Board of Superintendents with its uniform standard of comparison for the multitude of individual opinions hitherto prevailing; and when this decision is reached to abide by it. * * * To the graduates of the Normal School themselves the merit system will be of great advantage, because it bases appointment on the quality of their work as judged by their professional superiors, thereby substituting a uniform educational judgment for a varying personal one, often affected by friendly or political considerations. Individual teachers may at times derive advantage from personal or political standards of judgment, but it has always been demonstrated

that the conditions of work of a body of teachers as a whole have been vastly better when appointment and promotion were determined solely by professional standards. Such will be the case in the application of the merit system to the Normal graduates."

It should be remarked in passing that since their first establishment in 1906, these rated eligible lists have been invariably followed in making appointments to Boston schools.

Promotion by Merit: There has always been a presumption which at times unfortunately degenerated into a fiction, that promotions within the system, as well as original appointments, were made upon some sort of a merit system. The report of the Board of Supervisors relating to the establishment of rated lists, to which reference has been made, contained the following recommendation:

"Promotions of instructors in the service shall be made in the order of merit as determined by quality and character of service,"

and this provision was incorporated into the Regualtions of the School Committee.

During the administration of Superintendent Brooks a plan for promotional examinations was adopted by the School Committee, but the primal purpose of these examinations was to encourage professional growth rather than to insure advancement or preferment.

Early in the superintendency of Mr. Dyer, Mr. Ballou, subsequently assistant superintendent, was appointed Director of Promotion and Educational Measurement (April, 1914). It was the intention of Superintendent Dyer that promotions within the service should have a more substantial basis than priority of appointment, service in a particular district, or the endorsement of a principal or assistant superintendent. He evidently desired that there should be city-wide competition for promotive positions. Acting under the direction of the Superintendent, Mr. Ballou made a study of the subject of promotions within the school system, and submitted the results of his investigation together with many constructive recommendations in a report entitled, "A Plan for the Promotion of Teachers from Merit Lists" (School Document No. 2, 1918). In this report he summarizes the results of his study as follows:

"1. The plan for the promotion of teachers to principalships on merit has been worked out in co-operation with the candidates themselves, with the masters of districts, and with the Board of Superintendents.

2. Ratings of candidates for principalships shall be secured from the supervising assistant superintendent, the master of the district, and another assistant superintendent.

3. Appointments to principalships should be made according to the ratings of candidates, those having the highest ratings being appointed first. Ratings being equal, however, candidates who have served longest in Boston should be appointed first.

4. As far as possible or practicable, these methods and principles of procedure have been pursued in the rating and listing for appointment of candidates for other positions."

It was the practice of Mr. Dyer to request Mr. Ballou to make comparative estimates of the qualifications of teachers who might apply for a particular promotive position and to make these estimates the basis of appointments. Under the direction of the Superintendent, the Director of Promotion made a rather complete list of male candidates for elementary school principalship. He also prepared a rating for all candidates for submastership. These lists were grouped as "A1," "1," "2," etc. The lists were not made public. An individual, however, on application to the Superintendent might learn of his relative standing.

Upon his promotion to the Superintendency in 1918, Mr. Thompson, actuated by a determination to make his administration signally impersonal and impartial, requested the Board of Superintendents to make a list of all candidates eligible for the position of elementary school principal. The Board of Superintendents heartily co-operated with the Superintendent, and after careful deliberation a detailed plan was prepared for the rating of such candidates. This initial plan of procedure is discussed by one of the Assistant Superintendents in the Annual Report of the Superintendent for 1919. In this same report under the title "Extension of the Merit System of Promotion," Mr. Thompson speaks of this progressive educational innovation as follows:

"The merit system of appointment in the Boston school system has been extended to include a rated list from which are appointed elementary school principals, and, in the case of women, teachers of certain other ranks such as assistant director in the department of practice and training and master's assistant in the day elementary schools. This is a logical step, since a merit system based upon objective evidence of merit cannot be considered complete until all positions in the school service are filled as the result of a uniform procedure. Eventually every promotive position in the school service ought to be filled from rated eligible lists. A con-

siderable advance in this direction has been made in the case of appointments of elementary school principals and in a more limited degree in the case of masters' assistants. In addition, male assistants who are candidates for promotion to the rank of submaster have been rated on a more definite basis than formerly. Male candidates for the position of submaster who are not in the employ of our city have been appointed from rated lists for many years. The placing of male assistants in Boston on a similar basis is entirely appropriate and renders the procedure of appointment uniform in both cases."

During the following year there was still further development of this promotive principle. In his Annual Report of the year 1920 Mr. Thompson again discusses the subject and writes:

"When a vacancy for a principalship or directorship is opened it is now the practice to send from School Committee headquarters a circular letter to the schools announcing the vacancy and inviting candidates to file credentials. The Board of Superintendents then examines with great care all the evidence in connection with each candidate, evaluates the facts and makes a list. It is the practice of the Superintendent to nominate the candidate with the highest rating and the School Committee during the past year has uniformly confirmed these nominations.

In Boston for many years some method of determining merit has been maintained. The rules and regulations of the School Committee demand that the Superintendent nominate by merit. The present system differs from preceding attempts to determine merit in that the specific items of merit are listed, evaluated, and defined in definite terms. Another difference is that instead of one individual judgment, namely, that of the Superintendent, there is the group judgment of a Board. One characteristic of the present system that should inspire greatest confidence is the fact that the ratings are definite, recorded and published. Each candidate may see his rating, and interview the examiner and know specifically the reasons of the judgment in his or her case."

In his Annual Report for the year 1921, Mr. Thompson was able to announce that during the period of his administration, rated eligible lists had been prepared by the Board of Superintendents for principalship of elementary and intermediate schools, for head masters of two of the high schools, for directorships of primary supervision, for chief examiner, for master's assistant and first assistant grammar, and for first assistant in charge, and that these "important promotive positions have been filled as the result of open competition in the school service of Boston." And in conclusion Mr. Thompson said:

"The exact details of making the rated lists for promotion will progressively improve as experience accumulates, but the system itself ought to be cherished as a substantial gain for the Boston school system."

During the past year the practice pursued by Mr. Thompson has been continued. All existing lists have been uniformly followed in making appointments or promotions. In addition thereto, the Board of Superintendents has prepared city-wide competitive lists for head masters of high schools, and for first assistants in kindergartens. The Board also has prepared lists of candidates for the position of head of department of English in high schools, one for men, another for women. It is the intention of the present administration, so far as practicable, to keep constantly increasing the number of these Civil Service lists. The only obstacle to the immediate universal application of this principle is the burden imposed upon the Board of Superintendents in visitation of candidates and attention to numerous details incident to a careful, systematic and defensible rating. While the members of the Board very generously respond to these additional demands upon their time and energy, still there is a limit to the amount of work which they can successfully undertake. However, there is perhaps no service that the Board of Superintendents can render of more vital or lasting benefit to the schools than the extension of the merit system until all appointments and promotions are made strictly in conformity therewith.

The establishment of merit lists for original appointments and for promotion of teachers within the service is one of the most notable achievements in recent school administration. These lists are constructed on certain objective and measurable bases which are general in their character, and which in so far as possible apply to all candidates alike. These bases include general education, professional improvement and growth, personal characteristics, quantitative and qualitative experience in teaching, etc. They are made in a purely impersonal manner, in absolute good faith, with extreme care and by the best judicial intelligence that a school system can marshal. These lists are made in conformity with Civil Service practices, the utmost publicity is furnished all candidates concerning the method of rating and the results thereof, and the body creating the list stands ready to correct any error of judgment or to remedy any injustice.

Whatever imperfections may appear, as the plans and procedure of rating are developed, the operation of the system unmistakably facilitates the administration of the schools and tends to create confidence throughout the service. All ex-

ternal interference, political or otherwise, is reduced to a minimum, and in the long run capable and progressive men and women are more likely to receive just professional deserts than under any plan of appointment and promotion where the superintendent of schools is the sole judge of proficiency. Moreover, the merit system tends to eliminate discrimination against a candidate because of race, or creed, or politics. It is consistent with our democratic, social, and political organization. An elaborate merit system may be impracticable in smaller communities, but in the larger towns and cities school authorities in the future will find great difficulty in justifying appointments and promotions upon any other basis.

For a more definite statement relative to the procedure adopted by the Board of Superintendents for rating candidates for promotion, the reader is referred to the discussion of the Chief Examiner, Mr. Joel Hatheway, which appears in the appendix to this report.

Unification of the School System.

It is unnecessary at this time to relate the story of the introduction of intermediate schools and classes into the school system of Boston. Those who have read the recent reports of the School Department are familiar with the successive steps in this development. In all the discussions of this interesting topic, however, two outstanding objectives were recognized as fundamental and indispensable, namely, differentiation of the work of pupils at the end of the sixth grade, and the complete unification of the entire school system. Unless these objectives are realized the intermediate organizations are unjustified.

Differentiation: An objection to the traditional eight-four plan of school organization was its inflexibility. It seemed to ignore certain physiological and psychological changes that occur during the period of preadolescence. It deferred until too late a period certain choices of work by the pupils, and it failed to provide for individual inclinations and capacities; hence its unserviceableness. But the severest indictment against the eight-four plan was its lack of unity, the independence and separateness of the elementary and the high schools from each other. There was little or no articulation between these two divisions of the system, and despite repeated

and varied attempts to integrate them, it seemed quite impossible to establish definite points of contact.

In order to remove these barriers and misunderstandings, and to create a *modus vivendi*, it became necessary to depart from traditional paths and find common ground where elementary and high school teachers might meet, attack problems of common interest, become better acquainted fraternally and professionally, and, if possible, recognize one another's points of view. Therefore, Grades VII and VIII of the elementary school and Grade IX of the high school were selected as neutral territory where this unity of purpose might be effected. Thus these three grades gradually developed into a unit known in Boston as "intermediate." In time it became apparent that this intermediate unit was of such a character that it might link itself with the grades preceding and those following, and that although unlike both elementary and high schools, still it might retain the best characteristics of each. Into the seventh and eighth grades were introduced some subjects which had traditionally been regarded as belonging exclusively to the high schools, such as modern foreign languages, related mathematics, prevocational work, etc. These new subjects came to occupy the time and attention previously given to over-elaborate elementary programs, and to appeal vitally to the needs and desires of children who at this period of mental and physical development dislike reviews and crave for novelty. Thus differentiation in courses of study, in subject-content, and in methods of instruction began to occur not at the beginning of the ninth grade as formerly, but at the beginning of the seventh. Accordingly, in place of the eight–four scheme of organization, we have come to regard our school system as comprising six years of primary or elementary education; followed by six years of secondary education, the latter period being subdivided into three years of intermediate and three years of higher secondary instruction.

The gradual introduction of intermediate schools and classes into the Boston school system has brought about a variety of types of organization and some confusion in the nomenclature employed, all of which will disappear as the whole school system becomes unified. These various types may be enumerated and defined as follows:

a. The Intermediate School: This is a unit of organization comprising three grades designated as VII, VIII and IX. Grades VII and VIII

correspond to Grades VII and VIII of the traditional elementary schools reconstructed and reorganized; grade IX corresponds to the first year of the traditional high school. The three upper classes of the traditional high school—the second, third and fourth year—are named Grades X, XI and XII respectively. This is a simple and convenient practice which has the advantage of emphasizing the unification of the system. There are twelve intermediate schools which have developed out of former elementary schools by retaining pupils of the ninth grade, and are under the supervision of the principal of the elementary district. In addition thereto are two school districts which have an independent intermediate organization. This latter type is now the approved form of organization for Grades VII, VIII and IX, and the building plans for the immediate future provide for the erection of several independent intermediate schools.

b. The Elementary School with Intermediate Classes: This school consists of eight grades, the first six grades of the traditional elementary school, and Grades VII and VIII partially or wholly reconstructed and reorganized along the lines of the intermediate school. There are thirty-six such schools. These were formerly designated as elementary schools with modern foreign languages. From Grade VIII of these schools a pupil passes to the high school of his choice for the work of Grade IX.

c. The Traditional Elementary School: In addition to these thirty-six schools there are seventeen that still retain certain resemblances of the traditional elementary school organization. This type will gradually disappear and be merged with those in group "b" above. The evolutionary process, therefore, is from the old-time elementary school into the partially reconstructed intermediate, and thence from the incomplete into the full fledged intermediate unit.

d. The Sixth Grade Elementary School: This new type of elementary school is the logical result of the establishment of intermediate schools. As rapidly as intermediate units of organization are established throughout the city, the typical elementary school will comprise the first six grades. There are five of these schools at the present time.

From time immemorial Boston has maintained in its Public Latin School a six-year course of secondary grade instruction in preparation for college. The Girls' Latin School since its foundation has offered a similar course. Pupils have been admitted to these courses upon the completion of six grades of the elementary school. This six-grade secondary course has always been popular, and on the whole is regarded as a more satisfactory preparation for college than a four-years' course following eight years of elementary instruction.

During the past year the School Committee approved plans for the erection of an intermediate school (Grades VII, VIII and IX) in the Charles Sumner District, with the intention later of constructing an additional unit for the accommodation of pupils of Grades X, XI, XII. Thus a six-grade comprehensive

secondary school will become a companion of the two Latin schools and the success of this new organizational unit will be watched with unusual interest. It is not improbable that at the end of our quest for the unification of our school system we may finally find ourselves rather safely walking in the footsteps of the fathers.

Unification. It is evident from the above that the intermediate organization although on neutral ground has been a disturbing element, a disruptive force in our school system. But the shock while disquieting has not been critical. It has aroused school folk to a realization of the fact that the *status quo* may mean retrogression. Our educational system is incomplete, and we must remain dissatisfied with that incompleteness. But now that agitation in behalf of intermediate schools has ceased and that the philosophy underlying them is quite generally accepted, school folk are solicitous that the chief objectives of the intermediate schools become attained, and that the unification of the entire school system be assured.

Accordingly, all courses of study for Grades VII, VIII and IX have been revised and the subject-content of these courses has been carefully reconstructed. While not seeking rigid uniformity, still our aim must be so to unify the work that a pupil in a particular grade in any of the units of organization shall be doing substantially the same work as another pupil similarly occupied elsewhere. For instance, if a pupil is taking clerical practice in Grade IX, whether he is in the traditional high school, in an independent intermediate school, or in the ninth grade elsewhere, in any instance he should be performing essentially, if not identically, the same work. These courses of study for Grades VII, VIII and IX have been prepared with great patience and intelligence by teachers representing all grades of school above the fifth. Teachers from these various grades through interchange of views and discussion of common problems have discovered their own intimate relation to the school system. Bonds of professional sympathy have been forged among teachers of different grades, and as a result pupils are becoming released from the difficulties of maladjustment. In the meantime the Board of Superintendents has been offering numerous improvement and promotional courses conducted by our own experts, and designed to acquaint teachers with the deliberations and the approved recommendations of these councils.

While the teachers in the service have been formulating

courses of study, collecting material, and devising methods, a council on problems common to elementary and secondary schools has been fashioning the machinery of organization and administration of the various school units. This council is composed of the superintendent of schools, two assistant superintendents, three high school head masters, four intermediate school principals, three elementary school principals, and a principal from the six-grade schools. As a result of the conferences of this council, the hundred-point diploma plan has been improved so that all pupils in the school system at the beginning of the seventh grade begin to accumulate points toward the diploma which is awarded at the end of Grade XII. Each subject in the curricula of Grades VII to XII inclusive has been carefully evaluated by this council, and work successfully accomplished goes to the credit of the pupils as they advance from grade to grade. At the same time every precaution is being exercised to prevent any interruption of school work between Grades VI and VII. Thus elementary education in the sixth grade blends freely with secondary education, which in turn continues uninterruptedly from the seventh to the twelfth grade. Moreover, we are all beginning to speak in terms of Grades VII, VIII, IX., etc. The terms "elementary," "intermediate," and "high" occur less frequently in our vocabulary. Artificial barriers and designations are gradually breaking down. Some day, we trust, we shall have a unified system from Grade I to XII without any perceptible break in the child's onward progress.

This subject of unification was very deeply and clearly in the mind of our former Superintendent. He foresaw the possibilities and potentialities of the integrated school system, and believed the present time to be opportune for realization. His successor in office received this problem with all its insistence upon solution, and has attempted to preserve at least some of its momentum. At meetings of the Principals' Association the subject of unification has been repeatedly and sympathetically discussed by the Superintendent. At these conferences also each Assistant Superintendent in turn submitted progressive ideas and suggestions, abstracts from which are printed in the appendix to this report. Mr. Rafter discussed the place of the six-grade school in a scheme of unification. Miss Mellyn pointed out the inter-relation of the kindergarten and primary grades. Mr. Brodhead identified

manual and domestic arts with other school activities, while Mr. Gould and Mr. Snow urged the identification of the intermediate grades with those above and those that are below. During the coming year we shall continue to keep this problem persistently before us, confident that by the combined efforts of administrators and teachers all fictitious and harmful distinctions between grades or schools—all interruptions of the pupils' work or progress—shall eventually disappear and be replaced by a school system integrated and undivided.

The Teacher an Integral Part of the School System.

Various representative councils or committees are actively engaged in formulating administrative and organizational plans for the unification of the school system. The entire teaching force acknowledges its indebtedness to these councils and committees for the splendid services they have rendered. They have given a habitation and a name to much that existed in intangible and theoretic form. The subjects they have had under consideration, such as departmentalization, promotion by subject, diploma requirements, are largely mechanical; and in a more restricted sense the same may be predicted even of courses of study. But there is a spiritual phase of this discussion of unification which needs to be emphasized, and which in importance transcends any features that are material or mechanical.

The Individual Teacher: It is universally recognized that the teachers of Boston possess large personal initiative, and that they exercise this privilege to an unusual degree. This prerogative belongs to our teachers because they have proven themselves worthy to exercise it. Since the teachers are responsible for the construction of courses of study and for the development of methods of instruction, naturally a liberal amount of freedom is given the individual teacher in the interpretation of these courses of study and in the application of methods. This individuality of the teacher must be encouraged. It must be magnified rather than minimized. Nothing should be done to restrict it. The freedom of the individual teacher reacts upon the pupils,—the future exponents of free government. Moreover, we should avoid any appearance of bureaucracy. There must be no central control that attempts to

dictate arbitrarily. A strong centralization in general tends to weaken the power of the individual units, and in school administration it would woefully diminish personal initiative and effectiveness on the part of teachers.

Group Consciousness: The organization of teachers in groups is commendable, groups of individuals to freely discuss their own immediate common problems. These groups have a praiseworthy mission, namely, to establish friendly and co-operative relations among teachers whose work is very similar and whose interests are quite identical. There are very many such associations in connection with the Boston school system under the titles of clubs, councils, committees and so forth. Many of them are making helpful and constructive educational contributions. Individual initiative within these groups should be fostered. No group thrives by stifling individual power. The group prospers by assigning each individual to do the particular work for which he or she has especial aptitude. At a critical time one individual may supersede another. This is team work. At times the individual must volunteer—when he has confidence in himself born of certainty. At another time self-effacement is necessary. But let us not allow the individual to be sacrificed, even for the group. "The strength of the wolf is the pack; the strength of the pack is the wolf." This is the law of interdependence.

However, group or class consciousness must not be overstressed or over-emphasized. "Class consciousness is to be commended, but a desire for class dictation is the most insidious virus in American life today. If persisted in it will result in institutional instability and insecurity."

Identification with the whole: There is always danger that the individual, free and unrestrained, may become self-centered and unsocial. So, likewise, there is strong presumption that groups of individuals, becoming absorbed in their own affairs, may fail to perceive clearly the problems of other groups, to grasp the paramount significance of the larger whole, or to think in terms of the common welfare.

But the group, however important, sustains the same relation to the whole that the individual does to the group. Without in any measure losing its identity, the group should become a component part of the whole. In this union is strength. Here again appears the law of inter-relationship. The group must look outward and seek identity with other groups. There

should be established reciprocal relations and co-operative intercourse among all these integral parts of the whole. The advancement of the interests of any group of my fellow teachers (or fellow citizens) ultimately, if not directly, benefits my own. But whether it benefits me or not, it improves the general welfare and thereby merits my approval. Different groups then should co-operate heartily and generously with common purposes and common ideals toward a common end.

The Professional Spirit:—The most essential characteristic of unification is the development of the professional spirit. This implies devotion to the profession, the exaltation of a common cause. In the past there has been too much individual isolation, or too much group-exclusiveness. There is demand just now for a solidarity, for a unification founded upon a strong conviction of the indispensableness of popular education in a democracy. There is need of a renaissance, an awakening consciousness of the dignity and the nobility of the individual teacher and of the teaching profession as a whole. We should have justifiable pride in declaring not merely, "I am a teacher," but also, "I belong to a profession of teachers."

"As a man thinketh in his heart so is he." May such a spirit descend upon us, touching the *heart* first of the individual, then of the group, and afterwards of the entire profession, uniting all in the bonds of devoted public-spirited service. This is full fruition: "First the blade, then the ear, afterwards the full corn in the ear."

The Larger Outlook: Finally we must look beyond self, beyond group, even beyond the profession itself, and become sharers in the great inheritance which is ours as American citizens.

The great social, industrial, economic, political questions—the universal soul-cry for social justice—command our attention and enlist our co-operative participation. We can no longer remain aloof. The summons comes with its obligations and responsibilities of citizenship, in its broader, larger significance. Let us hearken to the new reveille manfully, bravely, patriotically. Our profession will be exalted commensurate with the intelligence and the unselfishness of our united service.

Respectfully submitted

JEREMIAH E. BURKE,

Superintendent of Public Schools.

APPENDIX TO REPORT OF SUPERINTENDENT JEREMIAH E. BURKE.

IN MEMORIAM

Frank Victor Thompson

Resolutions adopted by the School Committee, October 24, 1921:

A special meeting of the school Committee of the City of Boston was held in the School Committee Building, Mason Street, at 5.20 o'clock P.M., the Chairman presiding.

Present: Dr. Bogan, Miss Curtis, Messrs. Lane, O'Connor and Scannell.

The following preamble and resolution to the memory of the late Superintendent of Public Schools, Frank V. Thompson, were presented:

WHEREAS, For the second time in the history of Boston, the Superintendent of Public Schools has died in office, and an educational career, rapid and brilliant in past performance and filled with promise of future high achievement, has been brought to an abrupt and melancholy close, it is fitting that this Board express its appreciation of the loss that the public school system of Boston has sustained in the death of Superintendent Thompson.

Frank Victor Thompson was born at Batesville, Arkansas, July 28, 1874; a descendant of an old Massachusetts family, the Thompsons of Plymouth colony. His grandfather, Abner Bourne Thompson of Brunswick, Me., was a lieutenant-colonel in the Mexican war, and his father Edward Williams Thompson, was a graduate of Bowdoin College and served as a captain in the civil war. Superintendent Thompson himself had a military record, having been a sergeant in H company, 1st New Hampshire volunteers, in the Spanish American war.

His early education was obtained in the public schools of Portland, Me., and at Westbrook Seminary. He attended St. Joseph's High School and St. Anselm's College, both at Manchester, N. H., being graduated from the latter in 1895. He received his degree of Master of Arts at Harvard graduate school, and of Doctor of Philosophy from St. Anselm's.

He was principal of the North Walpole, N. H., grammar school from 1895 to 1897, and instructor in college mathematics in the Lawrence High School in 1897 and 1898. For the period

1898–1901 he was master of the Wetherbee Grammar School in Lawrence.

He became a sub-master in the Chapman Grammar School in East Boston, March 1, 1901; was appointed junior master in the South Boston High School, Sept. 11, 1901; head master of the High School of Commerce, April 9, 1906; was elected assistant superintendent, Sept. 1, 1910; and as superintendent of schools, Sept. 1, 1918, for the term ending August 31, 1924.

Mr. Thompson brought to the position of Superintendent an intimate acquaintance with the Boston School system and ripened educational experience, enthusiasm, and zealous and whole-hearted devotion to the duties of his high office. His comprehensive grasp upon every problem that came before him was remarkable and unfailing. He was never at a loss to point out the path to pursue. He was an indefatigable worker; a man of sound judgment; he had the happy faculty of associating with him those well qualified to carry out his policies, and he was ever more than generous in his appreciation of the worth of their services.

He was essentially a leader—capable, efficient, unflagging in effort. He never avoided responsibility nor hesitated in the performance of duty. He was ever in the front of progress, yet he never pressed forward rashly in fundamental changes. He was constant in effort to promote educational progress along sane and definite paths.

His courtesy was unfailing; his consideration for others marked. Whole-souled, genial, sympathetic, he readily made friends, and his honesty of purpose, his fairness of mind, his impulsive warm-heartedness, tempered by sound judgment, brought to him in full measure the affectionate respect of all his friends—and they were legion. He sought no personal glorification but rather the good of the entire school system.

There was a deep vein of spirituality in his character which guided and directed his ways. He inspired others with much of his own high idealism.

His reputation as an educator was far from being confined to the city he served. His opinion and advice were often sought by educational authorities, municipal, state and national; and any expression of his views was received with respect and large consideration.

He succeeded in enlisting the cordial and whole-hearted support of the entire teaching and supervising staff of the public

schools of Boston, and enjoyed in full measure their confidence and co-operation. The School Committee found in him a loyal, zealous and able executive whose decisions were based upon absolute fairness and impersonal convictions. No emergency found him at a loss; no question arose to which he could not readily suggest the answer. He was in very truth a gallant and inspiring figure.

The abruptness with which this career of brilliant achievement and great future promise has been brought to a close is shocking, and a sad reminder of the uncertainty of human life.

His home life was beautiful, and the warmest sympathy of this committee goes out whole-heartedly to his widow and children. Their loss is irreparable, and yet we may hope that as time goes on and softens the deep measure of their present grief, the recollection of his life and virtues will bring to them some consolation.

RESOLVED, That this preamble and resolution be spread in full upon the records of this Board, and that a copy thereof be transmitted to the family of the deceased.

The preamble and resolution were adopted unanimously.

IN MEMORIAM

Frank Victor Thompson

Address by Richard J. Lane, Esq., Member of the School Committee, at the Memorial Exercises at Symphony Hall, November 21, 1921.

Mr. Chairman, Ladies and Gentlemen:

We meet this afternoon to pay tribute to the memory of one who was a great leader of men and one of the foremost educators of our country, our late lamented friend and Superintendent.

This Commonwealth has furnished to the nation a long line of able and distinguished public men, but few names will be recorded higher on the list of those who have promoted the cause of education in our country than that of Frank Victor Thompson.

It is most appropriate then to have the Boston School service gather here today to honor his memory, and, while we cannot suppress the sadness that fills our hearts at his untimely death, we must yet rejoice that we were privileged to be his companions and friends in life and that our country, and this city in particular, has had the benefit of his genius and services.

Mr. Thompson was elected Superintendent of the schools of this city at a time when, to put it mildly, the strong hand of leadership was needed at the helm. Disorganization due to war had even invaded the schools of our country, and confusion and disruption existed everywhere. The new Superintendent by experience and training was eminently qualified for the duties of his new office.

As a boy and young man he had known many of the adversities of life. To his most intimate friends alone did he ever divulge the struggles of his youth. Imbued with the loftiest ambition, he struggled hard to obtain an education and it was only by indomitable courage and perseverance that he was able to overcome the obstacles which continually confronted him. These disappointments and struggles of his youth did not embitter him; on the contrary they strengthened, broadened and humanized him for the service to his fellow-men he was later called upon to give.

I was privileged to read, after his death, from the pages of his diary the inmost sentiments of his heart when he received his first appointment into the Boston school system. No vain or self-conscious note in that record but the sweetest expressions of gratitude and thanksgiving that his prayers had been answered, that he had earned and received recognition, and that a larger field for educational effort was now before him.

With his entry into the Boston service and proximity to those institutions where higher educational studies could be followed, he pursued assiduously course after course of studies which he believed would aid his advancement in the profession he so dearly loved.

The News Letter of recent date records the thoughts and motives that impelled him from the time he first undertook the teaching of youth. "The Teacher today," he writes "who is not a student of and thinker about educational problems cannot measure up to his obligations. The teacher who is not growing day by day is being left far behind. The growing teacher, the keeping abreast teacher experiences the joys that come to the discoverer who finds that his dreams can be realized. The explorers of continents and unknown land may today weep with Alexander that there are no more lands to conquer. But the period of discovery in the unexplored areas of education is just beginning. Teaching is not drudgery to the educational pioneer. Teaching is like a painting on a great canvas where the picture that burns in the soul can be translated. The teacher has the canvas, he has the colors, he has the brush and best of all, he has the vision of beauty that he would portray to the world."

This was his last message to you, teachers of Boston. Treasure well these words and the lessons they teach.

Passing from the positions of teacher, sub-master, master, assistant superintendent, he came at an early age to the Superintendency of our Boston schools. Instantly his fine gifts of leadership became evident. He grappled with every problem, worked with untiring devotion and won the confidence of all. We of the School Committee assigned him most difficult duties. He never hesitated, he never failed us. He advised us wisely and unselfishly. With a remarkable optimism, almost boyish in its freshness, he carried us along when we seemed to hesitate. He was brave, honest, unpretentious and considerate of all. His merry laugh broke many a spell of depression. He had the

rare gift of making work joyful and his happy, cheerful disposition was inspiring and sustaining.

As you will recall, much legislation had to be enacted in the early days of his administration to carry us through the trying times that were then upon us. Before the committees of the Legislature he was affable, but determined, and in argument invincible, for he showed, in fact it was part of his being, that he was enlisted in a holy cause, the teaching of youth, and, like the Crusaders of old, nothing short of victory would be acceptable. Yes, largely through him, Massachusetts learned that Boston was determined to lead the way in education as she has always done, and will continue to do, if men like Frank Victor Thompson direct our forces.

What were Mr. Thompson's fundamental ideas on education? I have heard him time and again quote the words of Horace Mann, that illustrious educator, "on schools and teachers I rely more than on any other earthly instrumentality for the prosperity and honor of the State and for the reformation and advancement of the race. All other reforms seek to abolish specific ills; education ministers to universal improvement. Other reforms are remedial. Education is preventative."

Some have referred to him as a great vocational advocate in the field of education. True, he helped with a master hand to build up those institutions in our system that had to do with the training of our boys and girls for particular business vocations. But I prefer to look upon him, as in truth he was, the friend, the advocate, the supporter and the leader in all forms and in all branches of educational uplift. With the assumption of the powers of Superintendent he showed that he was one of the broadest and most liberal of educators and that he was determined that each boy and girl should have the best rounded education a modern school system could give.

No more lasting monument will endure to what Mr. Thompson stood for as an educational leader, as a man of far vision and sincere concern for the future of the boys and girls of this City, in fact of the youth of this Commonwealth, than his forceful advocacy of a State University for Massachusetts. The Monday preceding his death, after delivering one of the most stirring addresses on this subject that it was my privilege to hear, he confided to me that it was his purpose to advocate with all his strength and power the establishment of this in-

stitution which he believed conditions were making imperative. That boys and girls who completed their course of studies in our high schools should be obliged to end their education, because they could find no college to enter, was to him a failure of democracy's aim that every boy and girl should have equal educational opportunities.

As one reads what he has written on the purposes of the public schools and the philosophy and hopes of democracy underlying them it would almost seem that the man was inspired at times, so sublime is his faith and so lofty his ideals. Well may it be said of him that few men in recent years have written or spoken on the subject of democracy and its mission with clearer ideas or vision than he. An exponent and leader in public school education in a great cosmopolitan community, with a large and varied experience and training, he spoke with an authority that demanded attention.

It is needless to assert here to you, who have heard him speak so often, that no man held more optimistic views on the future of our public schools and the educational institutions of our land. As each year he tabulated and reported an increase in the high school enrollment in our city, where the children of the immigrant predominate, he heralded the fact with pride and proclaimed anew his faith.

Actuated by motives of the highest patriotism, and that our Country might become stronger, happier and more united in education, he undertook his book "The Schooling of the Immigrant." In this work he critically surveyed the whole field of immigrant education as it was being carried on in our different States and suggested many valuable reforms. The difficulties of the times through which we were passing when this book was produced, made it at once of great national interest and importance.

The reputation of our late Superintendent was not circumscribed by narrow limits. He was known throughout the land, and there has passed out of the life of America a strong, valiant, forceful character,—a scholar, a patriot.

As we trace our way back over the few years he was Superintendent and recall what he was able to accomplish in that short space of time we cannot withhold our unlimited admiration and gratitude. To him must be given the credit for harmonizing the entire school service and under the spell of his influence differences have disappeared, and happily for the

welfare of the child the Boston school service is now united.

He advocated and inaugurated the extension of the merit system and rated list for promotion within the service and we, who know the firmness with which he adhered to this policy and the indefatigable zeal and patience with which he worked out with the Board of Superintendents the innumerable details this change made necessary, I am sure here and now will proclaim this the crowning victory of his administration. It will indeed be a bold and unscrupulous hand that will ever break down what he for the good, yes, the lasting good of education and the child, secured.

The unification of the school system was his one great objective. Artificial barriers between grade and grade or school and school were to him inventions that had no place in an American school system. He had succeeded to the Superintendency at a time when a vacillating policy meant disaster. He appreciated that there existed local and traditional prides or prejudices and went about his task with tact and judgment. He encouraged among teachers and masters long series of deliberations as to the best methods of adaptation but the policy, with the approval of the school committee, was fixed and under his leadership the process of unification was well upon its way. He left us policies which must be carried out. He tried to breathe into these policies the progressive spirit of the West. He used to say that Boston had brought to light nearly everything worth while in education but that the West had adopted and developed our ideas and the place of their birth had often been forgotten.

Time does not permit us to review the many accomplishments of his administration. Let it suffice to say that he administered his high office with wisdom and justice; that he never spared himself in his work but spent his energies lavishly in the public service.

For you teachers of Boston, he was ever solicitous and sympathetic. He urged and was a large factor in obtaining for you more fitting compensation for your services. He was ever ready at call of Nation, State or Municipality to speak or write in the cause of education. His was a busy but a very happy life, for the cause in which he worked was the greatest of all causes. To him education was inseparably linked with the progress of humanity. Secure are his name and fame for all time.

Mr. Chairman, I have attempted in a very humble way to express the sentiments of the School Committee, and may I in closing be permitted to say in a more personal way that to me Frank Thompson was an inspiration; he had all the attributes of heart and mind that attracted and fascinated me. I admired him for his zeal, his honesty and his ability. I loved him for himself. His last message to all of us was "carry on." He had treasured up in his heart for years the inspiring words,—"Be ashamed to die until you have won some victory for humanity." Frank Thompson had won many victories for humanity and he was not ashamed to die, and

"He so lived that when the summons came to join
The innumerable caravan which moves
To that mysterious realm where each shall take
His chamber in the silent halls of death,
He went not like the quarry slave at night,
Scourged to his dungeon, but sustained and soothed
By an unfaltering trust."

UNIFICATION: THE SIX-GRADE SCHOOL.

Address by Mr. Augustine L. Rafter, Assistant Superintendent, at a meeting of the Superintendent and Principals' Association, April 5, 1922.

I shall attempt in the time at my disposal to show that Grades IV, V and VI of a 1–6 school are not merely a truncated 1–8 school, lacking its apex, but rather that they constitute a new type, having some characteristics not generally found in the 1–8 system. In listening to my brief, I ask from you what Roosevelt termed "a mind open and to let." From the oldest to the youngest principal, you have from youth been accustomed to think 9 or 8 gradewise when considering the elementary school problem. It will be difficult, perhaps, to change a lifetime's habit, especially if you know the 1–6 type but vicariously. There are now four 1–6 schools, whose masters are absolutely and completely convinced of the worth and desirability of their schools. There is plainly apparent an assumption on the part of some upper grade teachers that they cannot do as high a type of work in a 1–6 school as in the seventh or eight grades of the conventional school; that the sixth grade teacher, for instance, in a 1–6 school, will suffer in comparison with an eighth grade teacher. Ask the members of the Board of Superintendents, who have recently, carefully, professionally, critically adjudged the work of submasters and of master's assistants, working, most of them, in the *top* grades of the two types of schools. Ask them if they weren't a little less than astonished at the poise, the adaptability, the force, the general strength of the men and women in the top sixth grades. The best history lesson I ever observed, bar none, was Grecian history in a sixth grade. But to my subject:

1. The sixth grade district being a less complex problem than the eighth is more effectively solved, and with a greater economy of time. It is composed of children of preadolescent age, a homogeneous group that responds readily to group instruction as in assembly talks and at other times for purposes of yard, basement, and community control.

This homogeneity makes the assembly far more potential and effective. It is as though the seventh and eighth grades were brought forward and the sixth is decidedly more responsible and responsive than formerly.

None of the pupils are "too big," as eighth graders often are, to be affected in the desired direction by simply guiding and controlling the instincts common to childhood.

2. In a six-grade district the middle grades, 4, 5 and 6, are given a prominence, at the top, that makes for the acquisition of such character qualities as dignity, poise, responsibility, initiative and real public spirit at an age when these qualities are most naturally and most easily accomplished, before the diffidence, the shyness, the self-consciousness of adolescence have arrived to serve as a block to progress along these lines.

In the eight or nine-grade district the middle grades are seldom assigned to any project of importance. They *are* middle grades indeed. We marvel and are astonished at the word and number knowledge of the early grades, and spanning the middle grades, we begin in the seventh and eighth to make demands that differ in kind and degree from what have been considered suitable for middle grade minds, but the possibilities of the middle grades of the new type are in turn truly astonishing us.

3. The six-grade district makes a fair distribution of equipment. The master of a district of whatever kind quite naturally regards the beginning and the end, the extremes, as the two most important parts of his problem, and the longer his problem, the slighter attention given to the middle.

Every master of a newly-formed six-grade district is impressed by the meagreness of equipment in the 4, 5 and 6 grades. The primary grades, thanks to the two excellent primary supervisors and to the Primary Council on Books and Supplies, are adequately furnished with books and educational materials. Possibly some are over-furnished. I feel certain that this is true in some instances. As an example, I found in a certain second grade twenty-two sets of reading books. The Primary Council just mentioned has proved its worth over and over again, and analogously, a Council for the middle grades should be of inestimable value. I shall ask the Superintendent to appoint such a Council at his pleasure.

4. The separate six-grade district assures serious consideration and a more even justice in promotion and demotion of pupils.

It is a more serious matter to promote a child to another district than it is to promote him to another class in his own district. It calls for certain well-grounded reasons that give the act a degree of finality.

Demotions to another district, likewise, call for more judicial consideration than do similar acts that may occur within one master's province—in fact, they seldom or never occur.

5. Consider the personnel of the sixth grade in the 1–6 school. When before did the sub-master and the master's assistant teach in the sixth grade? Feminizing the schools indeed! This is the first instance in Boston in which a pupil in the middle grades meets a high grade man's way of teaching.

6. The 1–6 school has recognized as its very own the fundamentals. The shortened line of its activities has revealed and defined and placed more exactly than before the essentials, the fundamentals. Mr. Lamprey's fine, vivid account a month ago, of the socialized school, if I caught him aright, seemed to indicate that a fairly hard and fast standard had been established for each grade.

7. The principal of a sixth grade school, his conventional responsibilities abridged, concentrates on fewer subjects, fewer grades, fewer pupils, ever stressing the fundamentals and correspondingly checking up results, thus revealing the weak places and setting about to remedy them.

And now the gap! Are we creating a new one? There's danger of it, but it is not nearly as wide as the eighth grade to high school chasm. The sympathetic bond between sixth and seventh grade teachers is the stronger because of the more intimate knowledge each has of the other's work. The better prepared sixth grader, who has been better taught in the use of books, who has already met departmental teaching, who is fundamentally stronger than formerly, should feel more at home in an intermediate seventh than the conventional eighth grader experiences in the ninth grade. The very best span for the gap is, of course, a more common knowledge of and sympathy with the other fellow's work. It is sometimes pitiable and distressing, not to say irritating, to listen to the replies made by pupils in the ninth or tenth grades on subject matter that has been adequately handled one or two years previously. I have repeatedly asked a pupil giving a half answer to a question, from what elementary school he was graduated, and when his reply was received, I have said: "And do you think Mr. So-and-So or Miss So-and-So would have tolerated such a slip-shod answer as that?" His response is usually a shamed-faced "No." The point I am trying to make is that the ninth or tenth grade teacher should have a greater familiarity with the calibre of

the work done in the seventh and eighth grades, so that he will be in a position to know what to reasonably expect from his pupils under questioning.

To summarize: The 1–6 type has established itself as worthy and desirable:

1. Because the homogeneity of its pupils at the preadolescent age makes for a readier response to instruction.

2. Because the middle grades are given a prominence that fosters character qualities, dignity, poise, responsibility, initiative, real public spirit.

3. Because it makes for a fairer distribution of equipment,—the middle and not the extremes are emphasized.

4. Because promotions and demotions are more seriously, and, therefore, more justly made.

5. Because the pupils meet both men and women teachers two grades earlier than formerly.

6. Because the fundamentals are recognized and treated as a *magnum opus*.

7. Because of the principal's abridged responsibilities he is free to concentrate on fewer pupils, fewer subjects, fewer grades, and the educational solution approaches nearer to saturation.

UNIFICATION: INTER-RELATION OF KINDERGARTEN AND PRIMARY GRADES.

Address by Miss Mary C. Mellyn, Assistant Superintendent, at a meeting of the Superintendent and Principals' Association, April 5, 1922.

The *unification* of education means a *true* progression from kindergarten through high school, because we speak in terms of the children whom we are educating. For too long a time we have asked ourselves "What shall we teach?" or "How shall we teach?" not "Whom are we teaching?" Now that we are thinking in terms of childhood, its equipment, its needs, its purposes, we are approaching an educational renaissance. Education will be a steady onward advance for the child as he reaches out from the recognition of gross situations to the understanding and appreciation of the complexities of life. This is the purpose of our schools to give him his intellectual, social and spiritual inheritance from the kindergarten through college, and we do this best when we recognize in what manner this process may be unified.

The child educates himself long before he comes to us. Could we find the secret of his method we might be helped, for we would be working in harmony with the laws for his development and we would be using the resources which are his.

To unify education, we must find the resources which have been given to the child, and we must understand the laws which govern his development. There are now recognized three distinct stages of development for the school child. First, from four years to eight years, second from eight years to twelve years, and third from the age of twelve through the adolescent years. With the first it is my plan to deal.

When the average school officer talks to a kindergarten teacher, he says blandly, "Keep the children happy." When he talks with a primary school teacher, he says, with more serious mien, "Keep these children busy!" and this attitude of mind has done more than any other to keep the primary school and the kindergarten separated. Let us recognize in starting out that children are happy only when they are purposefully busy. Oftentimes, the busy child of the primary school is an irritated child, because in the futile task set him he recognizes no purpose. With all children, life is a serious

attempt to solve problems outside of school, and it should be so in school. Let us see why the child himself gives us a reason for the unification of the kindergarten and the primary.

1. Through all these years the child is gaining control of the larger muscles. These are the years in which he grows gradually to learn to stand and skip and jump and run. These are not the years for finer muscle co-ordinations, the lack of which is revealed as he handles crayon, scissors, etc. This inability to make finer co-ordinations results in much crudity oftentimes and it is not for us to force transition.

2. In these years, the child recognizes units, gross situations, wholes, and gains all his new experiences through his senses. He lives in his imagination and through this he is enlarging his mental horizon to realms which experience does not permit him to enter.

3. His interests lie in activity, in doing, in simple dramatization, in drawing, in short in the desire to express himself in some way, to tell of his own experiences. Through it all in these first years, he is reaching out trying to unify these experiences, trying to get meaning out of his environment and trying to explain this great "buzzing world" in which he and his elders live. These are the years in which his reaction upon life, stimulated and aroused by good teaching, will lay the foundation for all the curiosity of the later years.

What does he have in himself that we may touch? First that by which he has learned much before he comes to school, the great reservoir of instinctive tendencies. In these years, we tap these reservoirs and through imitation, through play, through curiosity, through collecting, through construction, easily and naturally the child is led to new fields of knowledge. The able teacher, like the engineer, charts her country, knows how to appeal to each of these instinctive interests and so allies herself with a great natural force.

What does this tell us about the instruction in these first four years of school life? If the child is to attain his best development, there must be a similarity of aim, there must be the same spirit behind the methods of teaching, and an equipment not too diverse. Let us consider each—

1. The aim in kindergarten-primary instruction is three-fold—
   (a) To enrich the experience of the child.
   (b) To help him to organize that experience.
   (c) To lay the foundation of good habits.

(a) To enrich the experience of the child.—The words which the child hears in the kindergarten and the symbols which he sees as he reads in the primer are as great luminous windows through which in imagination he sees the fields and pastures new which are a part of his education. Each represents an experience, each is adding to his store and enriching life. Whether it is the bursting milk weed pods or the visit to the park, or the lovely picture, all these things are the child's right and the school should *give* and *give* and *give*. So through object, through story and through experience in short field trips, enrichment is going on.

(b) The child is helped to organize his experience and express it.

We have the time given over to simple dramatics, to plays and games, to simple story telling on the part of the child, to automatic response in the organization of the number facts, to simple problems in the technique of English composition and spelling, to free expression in the crude drawing which means so much to the child and in the construction work which is his delight. Our method of approach to primary work through the story, through dramatics, through drawing, and through constructive work will serve to bridge the gap.

This has been done. See School Document No. 7, 1920—Project Teaching in the First Grade. And it can be done again.

(c) These are the years in which we lay the foundations of good habits. The years from eight to twelve are the great habit-forming years, in which the habits made, persist, but in these earlier years right habits are begun.

How shall we carry over the right attitude towards childhood through the kindergarten and primary school and keep the right spirit back of the methods of teaching? Give the children a chance to live in their schoolroom. A little boy was asked if he liked to go to school. "Yes" he said, "I like to go to school and I like coming from school, but I don't like staying in school." Mechanical work has killed the spirit of many a teacher and many a child. Purposeful, meaningful work, reaching down and tapping instinctive forces, the capitalizing of capacities for leadership, etc., in short a better knowledge of childish needs and resources will lift all primary schools and kindergarten teaching on to a pedagogical plane unknown. What equipment do we need to unify the work of these years?

The desk is a workshop and the program of the unified kinder-

garten-primary course should be Recitation—Study—Leisure. How may we solve this problem?

1. We need floor space in primary classrooms. We would like a combination of screwed down desks and movable chairs.
2. We need kindergarten chairs—an occupation table—and materials for construction work in each class room.
3. We want a library corner in each classroom.
4. We need more optional time from course of study.
5. We ask that the kindergarten room be more constantly used.
6. We need the special attention of each principal to this part of the work. There is not in our city a modernized primary classroom. Who will be the first to establish one? Teachers of experience are eager for it. We need your enthusiastic support for new equipment.

The time will soon come, too, when we shall have the connecting class for the immature kindergarten children who have been forced on to primary through lack of room. These children who make up the large number of the retardates in grade one could have a real kindergarten program for five months, and a kindergarten-primary for five. These children waken later mentally, and need to re-live the experience which they have had. Better to re-live the kindergarten experience and grow than to sit with confused minds trying to get some meaning out of the grade one experiences. We should like to have the kindergarten room used every afternoon session by some class for free activities. If this entails extra janitor service, it should be provided for.

In short, we ask that the opportunity for freedom, initiative for the development of the play spirit and for growth be kept a part of the child's life during all these years,—so that the primary school may be more than a place of mechanical attainment through which the spirit is slowly and certainly killed.

So to unify this work in the schools let us carry the spirit of childhood into our interpretation of the course of study. If the principals are generous with their allowance in the primary school, they will realize on the investment when the children reach the upper grades. An enriched kindergarten-primary course means an enriched grammar course with alert, curious,

eager-minded children. A starved, meagre equipment means a narrowed vision, a shortened horizon—dullness and apathy.

Remember that the seed that is sown in the kindergarten-primary classes will return in a harvest of generous measure in the upper grades, for the gifts of the early years live in abiding memory.

UNIFICATION: MANUAL AND DOMESTIC ARTS, ETC.

An address by Mr. John C. Brodhead, Assistant Superintendent, at a meeting of the Superintendent and Principals' Association, May 2, 1922.

The subjects assigned to me are largely of the motor type, and because success may be approximated in them by those not so successful in work involving only abstract thinking, there is a tendency on the part of some teachers and principals to place them on a lower level than the purely academic subjects, forgetting that many pupils fully capable of pursuing abstract work, prefer to become educated as they expect to live later, that is, by thinking and doing concurrently. Moreover, as we see in the history of the race and of the individual, good thinking has commonly been the result of good performance; and as Prof. James has truly said, good thinking not followed by performance is demoralizing. In a community largely dependent for its predominance on brain and skill, no apology is needed for production of the latter. The skilled product of our schools and courses is essential to the permanence of our institutions. In the language of the Apocryphal prophet,

"They stand not in the gates of the city. They are not heard for their much speaking, but without them is the city not inhabited."

Grades I–III and IV–VI.

In the primary grades are taught love of order and sense of beauty, and the use of the simpler tools of measurement and representation. These powers are developed through the efforts of special teachers of sewing in grades IV, V, VI, and of shop work in Grade VI; by a more intensive study in these grades of color, design, representation and imaginative drawing, and of the working drawing; and by the use of the rule, shears, paste, etc., in cardboard construction and elementary bookbinding. An incidental product of the last-named course, for boys, is the increased respect for books resulting from the construction of simple, bound books.

I am convinced of the wisdom of the 6–3–3 plan. Its development in this city makes questionable the continuance of shop work, as such, for boys in Grade VI. No six-grade school can keep a shop fully employed, and the travel of pupils between schools is objectionable. Moreover, with rising costs of con-

struction and instruction, the retention of the combination of special room and special teacher seems only defensible in connection with a departmental program. A solution must be worked out that will provide motor participation for the boys not subject to the objections referred to.

Intermediate Grades (VII, VIII, IX.)

The addition of a modern foreign language to the academic curriculum of half of the pupils in Grades VII, VIII and IX does not create an intermediate school in the opinion of the administration, nor a junior high school as that expression is interpreted throughout the country. Properly to bridge the famous gap we must not only begin to departmentalize, but we must have try-out courses in the first year leading to intensive preparatory courses in the two following years, in clerical practice, in the practical arts for girls and the mechanic arts for boys, as well as in foreign language. Within the "arts" courses of Grade VII, there should be varied experiences for general intelligence and education and for pre-vocational purposes.

In the fields of the "arts" courses referred to, let me outline to principals of intermediate schools a program of utilization which has yet to be realized in this city. In co-operation with the respective departments concerned, secure as many shops as can be used to 100% capacity. Then in accordance with present courses of study use the various facilities for three purposes as follows:

1. For all pupils in clerical practice and modern language courses,—three periods weekly.
2. For pupils electing an "arts" course, possibly intending to go on to Grade X in a special high school, to Grade IX in a co-operative course in a general high school, to trade school, or into industry direct with advanced standing,—fifteen periods weekly.

(The grade IX courses of this type have been revised to offer more drawing, science and mathematics as a preparation for Grade X in special schools.)

3. For pupils academically retarded, but neither mentally deficient nor incorrigible, formed into a prevocational class outside of the departmental system except as to shops, with closest and most immediate correlation, with a six-hour day and with no home study,—approximately

two hours daily. Under the present organization of the prevocational centers, a high percentage of pupils persist to graduation and 50% of the graduates enter secondary schools. It is desirable that the pupils for these classes be admitted to the precincts of the intermediate schools regardless of grade, if over 12 years of age and otherwise eligible, and that the course be extended to fit for Grade X.

The equipment of these shops should not be elaborate nor expensive, but with their variety and with three years contact, there would be offered a fair equivalent of a first year high school shop training in knowledge, habits and initiative.

Grade X–XII.

The work of our secondary schools is so well known that I hardly need to mention their place in our scheme of unification as related to shop courses.

The teachers, academic and trade, are drawn from the same lists for our continuation, trade and high schools, and promotions are made from one group to another.

Committees of the high school councils have been at work on courses in mathematics, science, English and history–civics-geography, for the co-operative courses. The standards of conventions in mechanical drawing for example, as used in high schools, are carried down even to Grade IV. The next extension in co-operative courses would seem to be the introduction of such courses in clerical practice which would probably be as immediately successful as the new co-operative course in salesmanship.

Pupils in the trade school for girls who are not graduates of elementary schools are given an opporunity to complete their elementary education while learning their trade, a fine bit of work.

I cannot forbear speaking of what I consider a shortcoming in our secondary schools. We do not seem to provide adequate training for our girls in domestic science and household arts. We have one school adequately equipped for those who wish to major in these subjects and a few other schools have meagre equipments, but in these only a few girls receive the instruction and for but a short time.

I know that this is not because of lack of interest on the part of the principals, but in view of the fact that the average per-

sistence of young women in industry is but five to seven years. I wonder how long we are going to let the curricula, which prepare for these business contacts, prevent us from offering adequate training for home-making, the ultimate and enduring vocation of women and a substantial fraction of the foundation for a contented, successful democracy.

The gardening work in the elementary schools and in our prevocational centers has, in addition to its fostering love of nature, contributing to science, and the beautifying and provisioning of the home, led a substantial number of pupils into the co-operative agricultural course at the West Roxbury High School, from which they are now going to Massachusetts Agricultural College at Amherst. This course is the largest high school course of its kind in the state.

Under the supervision of the department of evening schools, we find the day school for immigrants teaching English to foreign children, who, after learning the fundamentals of English, are sent to the regular grades, if of school age.

An important thread running all through our grades and beyond, is that of vocational guidance. As its name implies this department guides young people into profitable, suitable employment. It does much more than this. It guides in the choice of courses, looking toward the vocations or toward higher education. It finds ways of enabling pupils to secure further education and it sympathetically follows them into and in employment through a term of years.

It is unfortunate that the budget of the School Committee here, as in many other directions, prevents the expansion of a potent force for good in our school system.

In closing, I would state that I am more than ever impressed with the thought that we are all concerned in educating our citizens (for such they are) not for life but in living and that therefore our courses must include those agencies other than books, which surround us in our out-of-school living and without which we would be out-of-date, unhappy and unsuccessful.

UNIFICATION: INTERMEDIATE AND HIGHER GRADES.

An address by Mr. Arthur L. Gould, Assistant Superintendent, at a meeting of the Superintendent and Principals' Association, April 5, 1922.

It is the purpose of this brief address to discuss the unification of the school system from the viewpoint of the intermediate school, with special reference to the problem of adjustment between the intermediate school and the high school. In order to present the problem clearly and definitely, a brief statement of the situation as it now exists seems essential.

At the present time the organization of the elementary and intermediate school districts may be classified as follows:

I.	Intermediate districts	3
	These districts teach modern foreign language and have pupils entering from contiguous Grade VI districts.	
II.	Grades I to IX with modern foreign language . . .	10
III.	Grades I to VIII with modern foreign language . . .	22
IV.	Grades I to VIII without modern foreign language but with departmental organization	15
V.	Grades I to VIII (traditional type)	17
VI.	Grades I to VI	4
	Total	71

From the first five of the above groups we have pupils entering our high schools, some with a credit for the first year high school work, some with partial credit acquired in modern language, in Grades VII and VIII, some from Grade VIII with a training under the departmental system of instruction, and, finally, some who have completed the eighth grade of the traditional type of school where departmental instruction is offered only in the special subjects. The problem of assimilating these groups in the high school, so that the work may continue without loss through duplication of effort and so that opportunity may be provided for progressive advancement of the varying interests, needs, and capabilities of the individuals comprising each group, is a tremendous one and well worthy of the highest type of skill in school organization and administration.

Any change affecting a long-established policy of administration of the public schools of a large city is bound to result

in difficult problems, some of which may be anticipated, while others must be met and solved during the process of readjustment. In Boston, the chief difficulties in the establishment of an intermediate school organization are those growing out of inadequate school buildings, small pupilage in certain school districts, and lack of properly qualified teachers to carry on the new type of work.

In districts fortunate enough to possess a modern school plant and a school population sufficiently large to warrant segregation of grades VII, VIII and IX into effective administrative units, the transition is made easily and without serious difficulty. In some districts the problem of transition to the preferred type of school unit is one which will require years before any satisfactory solution can be made, for consideration must be given to the financial as well as to the educational aspect of the question. Because of these considerations we shall have varying types of school units for some time to come, but in the meantime we are meeting the vital problems of internal reorganization and adjustment which constitute the heart of the intermediate school movement.

These internal problems arise chiefly from the fact that the intermediate school presupposes a reorganization of the materials of instruction based upon the varying needs and abilities of the adolescent pupil. To administer the new curricula of studies so that it will be of most advantage both to present and future needs of the pupil, due consideration must be given, first, to differentiated courses of study in order to provide for recognition of the varying aptitudes and abilities of children; second, to the principle of election and expert guidance so that we may recognize pupils as individuals with worthy individual ambitions, which we respect and hope to develop to an extent measured only by the capacity to understand and accomplish; and, finally, to the fact that each pupil entrusted to our care shall come in contact, through a departmental organization, with a carefully trained teacher who, through special knowledge of the subject and skilful teaching technique, may open for him new fields to serve as a basis for the more thorough exploration of his choice of work, either in the school just beyond him or in the world of industry which the economic conditions of his parents may require him to enter.

With these objects in view the Board of Superintendents some years ago began the problem of reorganization of the

courses of study. Teachers of recognized worth were organized into councils representative of all types of schools. The work to be undertaken was placed before them and likewise before a conference committee composed of high school headmasters, principals of intermediate schools and elementary schools of all types.

After long continued study a progressive forward looking plan of procedure was developed which held the conference committee responsible for the large administration features, and individual committees responsible for the detailed working out of necessary modifications in courses of study, methods of instruction, standards of promotion, departmental programs and other features incidental to a thorough reorganization of the materials of instruction in Grades VII, VIII and IX.

As a result of the study made by these committees the work of Grade IX was gradually standardized throughout the city, so that a pupil of Grade IX was completing the first unit of his high school course whether he was in his own local intermediate school or in the first year of a regular high school. Courses of study in modern foreign language, mathematics, and clerical practice were first completed and committees are at the present time engaged in a thoroughgoing revision of the course of study in history, geography, civics and science.

To make provision for whatever uniformity of teaching method and teaching content seemed desirable, conferences were held regularly for teachers of the revised courses of study in modern foreign language, mathematics and clerical practice in various districts of the city. These conferences were in charge of teachers who were thoroughly familiar with the aim, purpose, and content of the reorganized course of study. The meetings were in reality forums for the discussion of problems that arose as the teachers progressed in the new type of work.

In addition to these conferences improvement courses were offered by the Board of Superintendents for the more thoroughgoing preparation of teachers to undertake the new work. These improvement courses have generally been conducted by heads of departments in the high or normal schools.

A progressive series of courses for teachers of grades VII, VIII and IX began in 1917. Since that time 110 high schools teachers and 1520 elementary and intermediate teachers have availed themselves of the instruction offered in these courses. During the present school year (1921–1922) six improvement

courses were offered. Attendance was limited to teachers or prospective teachers of Grades VII, VIII and IX.

There were in attendance at these courses 283 Teachers of elementary or intermediate schools and 7 teachers of high schools.

Since the intermediate school undertakes the work of Grades VII, VIII and IX, thus involving at least some of the work of the regular high school, it is significant that, in comparison with the number of elementary and intermediate teachers, so few high school teachers have availed themselves of the opportunities afforded by these courses and particularly in view of the fact that practically all of the instruction offered was given by teachers in the high and normal schools. Doubtless many high school teachers have been taking improvement courses in colleges and universities, but this also holds true for the teachers of the elementary schools.

The problem of unification involves reorganization and readjustment in both types of schools and it can reach the maximum of effectiveness only as teachers from both high and elementary schools acquaint themselves with the fundamental principles involved. Moreover, it is a local problem which can best be met through courses offered by those thoroughly familiar with the detailed plan of reorganization adopted for our own schools. If this be true for those teachers already in the service of the city during the process of reorganization, it is doubly true of the large body of newly certificated teachers who are annually appointed to the upper grades of our elementary schools and to the beginning years of the high school. A first step, therefore, in the process of co-ordinating the work of the intermediate and high schools is the recognition by both schools of a problem which can be solved not alone through a curriculum adjustment of the lower grades but also through such modification of the work of the high school as must come when the spirit and purpose of the intermediate school is known.

New or modified curricula can become effective only through unity of effort for the improvement of teaching. This in turn can be achieved only through the work of supervisors who have a clear and definite vision of the objectives to be attained. On those entrusted with the work of supervision falls the responsibility of seeing that the approved course of study is correctly interpreted and faithfully followed by the classroom teacher. Until the modified school program is thoroughly

comprehended by teachers in general, this supervision must be very thorough, especially on the part of those directly responsible for the interpretation of the course of study for a given school or for the teaching of a single subject within the school. A further aid, then, in establishing a close co-ordination in the work of these schools is a thoroughgoing, systematic supervision by various officials who, through frequent conference and discussion, have acquired a clear and definite ideal of the objectives to be realized through their co-operative leadership.

Teachers from both high and intermediate schools should frequently visit one another's classes. There is no surer means of securing that mutual respect so essential for real, harmonious, co-operative work. Occasional inspirational addresses by some recognized authority on the larger phases of intermediate and high school work, with the opportunity provided for both groups of teachers to meet together, will supplement and lighten the more intensive study required in the pursuit of improvement courses.

Clear, accurate knowledge of the spirit and purpose of any type of school will do much to make definite the place of that school in the educational sytem and will develop among teachers a sympathetic understanding and appreciation of that type of work, which, through differing from their own, is, however, none the less important in its contribution to the final end and purpose of education.

Within the last year an attempt has been made to standardize the marking system by which we measure the progress of pupils in our schools. This study was made largely because marks in Grades VII and VIII now form a part of the high school record upon which the granting of the 100-point diploma is based. Consequently, some degree of uniformity was thought desirable. Limits were set as to the probable range of A's, B's, C's, D's, and E's. Words descriptive of each mark and percentage values were given to aid in making the meaning clear. This was certainly a step in the right direction for unifying the work from Grades VII to XII, inclusive. However, there remains to be made a further study to determine what factors should enter into the individual mark, such as the class test, the examination, the pupil's effort, the pupil's progress, and similar essentials, all of which are considered by teachers in estimating the mark of the pupils but in varying degrees because of no uniform agreement as to their relative importance.

Perfect uniformity is impossible of achievement and not wholly desirable, but an approach to uniformity in evaluating our ratings will do much towards unifying the work of the intermediate and high schools.

This discussion has offered only a few of the larger measures for the purpose of harmonizing and co-ordinating the work of these schools. We shall all be working with a more intelligent purpose when we are able to think in terms of the individual child, take him as we find him, and do our best to develop him to the limit of his capacity.

UNIFICATION: HIGH AND INTERMEDIATE GRADES

An address by Mr. William B. Snow, Assistant Superintendent, at a meeting of the Superintendent and Principals' Association, May 2, 1922.

The past few months have been for me months of revelation. I had been in the service since September, 1885, was perhaps as well informed about general school matters as the average teacher, and had not intended to be narrow or snobbish; but my problems had been those of the high school man, and particularly those of one working in a big high school for boys. I had put my heart into the English High School, and other things looked small in comparison. Since my transfer I have had an opportunity to see the work and problems of other high schools, of different types of intermediate schools and classes, and of elementary schools. Perhaps the very fact that I knew so little about some of these matters has made certain things stand out with a clearness and distinctness which might otherwise have been lacking. May I mention first certain general conclusions that have impressed themselves upon me, and then take up particular topics?

Most of all I have been impressed with the enormous extent and complexity of the educational system of which you and I are parts: the variety of work, the different groups of workers, each with its own organization, yet all inter-related and functioning together. I have felt very humble indeed as question after question has come to me, and I have had to seek the desired information from some well-informed clerk, who generally knew exactly where to find it, or from some colleague or director who remembered just when that same question had been raised before, what answer had been given to it, and what considerations had led to that particular answer instead of the one which first occurred to me. In the light of this experience it seems to me that the first essential for attaining that unity which we desire in our system is a conviction that we must be all working together like the wheels of a watch; an attitude of appreciation of the other fellow and his job; a realization that there can be no question of higher or lower, more important or less important; but that as every wheel must turn right, each in its own place, if the watch is to run true, so

every teacher's work is essential to the whole and must be faithfully and skilfully performed.

That kind of organization implies a clear definition and delimitation of each man's task, a recognition of the fact that the whole system will suffer if any man's special work is badly done, a willingness to concentrate on one's own duty, with confidence that our comrades may be trusted to be no less competent and resolute to do well their parts of our common undertaking. We need the kind of co-operation that has faith in our fellows and is determined that their faith in us shall be justified by our performance of what they depend on us to do.

This concentration on one's own task does not mean an egotistical self-sufficiency, or an indifference to the opinions of others; it means a desire to learn from them all we can about how to do our own work better, not a desire to tell them what we think they ought to learn from us. It does not mean regarding one's own task as an independent thing apart from what precedes and from what must follow. Every part of the work must be viewed as the natural continuation of what has preceded, and as effective preparation for what is to follow. The dominant note of all instruction must be adaptation to the needs, interests, and powers of the child as we find him; but the ability of the instructor appears largely in the skill with which he bases this instruction on what has preceded, and makes his results a proper foundation for what must be built thereon.

Leaving now these broader generalities, what are the more specific things needed for better correlation between the work of the high school and that of the intermediate grades? I mention first a more careful study, on the part of both principals and teachers, of the courses of study prepared for various subjects. The most competent people we have in the service have given their best thought to the preparation of these courses. Specialists in the subjects, skilful teachers of both high and intermediate schools, have labored long and earnestly to make these outlines. They are the chart by which we must sail if we are to avoid rocks and collisions, if we are to reach safely the port which we seek to attain, if we are to proceed as a fleet and not as independent units. They must be followed scrupulously if every teacher is to know where his work begins and where it ends. Otherwise pupils are discouraged because in the new grade things are demanded of them which they have never been taught; they are discontented because they are not asked

about things which they have learned and are eager to express; they are uninterested because what is expected to be new work for them has been prematurely presented and has lost its charm, possessing neither the freshness of the untrodden field nor the satisfaction of a well-mastered acquisition.

Failure to follow the course of study is unfair also to the next teacher who can neither be sure that the pupil knows well what she has a right to expect of him, nor that he has not already been nibbling where she expected him to find green fields and pastures new.

Not all of us realize, perhaps, the care and thought which have been given to these courses of study. In general, they were prepared by committees of teachers selected for their competence; the reports of the committees were discussed, amended, and finally adopted by the Councils; from the Councils they went to the Head Master's Association; next they were given careful consideration by the Board of Superintendents; and finally the School Committee approved them, and ordered them printed. The teacher who disregards them is likely to be viewed in the same light as the recruit who discovers that all the rest of his company are out of step.

The greatest danger of maladjustment lies in Grade IX. If in this grade distinctly elementary views prevail, while in the high schools teachers plod along in the ruts which they have long been following, some since they themselves were pupils, there is sure to be trouble when the two sets of pupils come together in Grade X. There must be a mutual approach. Each group has much to learn from the other. In general, the high school teacher knows more about the subject, the elementary teacher knows more about the child. The ideal teacher knows both.

The high school teacher should spend some of his afternoons in the intermediate classes, observing their methods, planning how best to adjust his own work of the following year to what he sees the intermediate pupils doing, noting the neatness and attractiveness of the room, the responsiveness and initiative of the pupils, the attention which has evidently been paid to preparation of the lesson and to the technique of its presentation. Let him resolve that his own work shall not suffer in the eyes of those pupils when they come to him the following year, by an unfavorable contrast in these particulars. If some phase of the subject is not receiving the attention he would

have given it, let him note that also, with the resolve that he will himself teach it carefully before he demands too much of the children in that particular. A suggestion concerning such an omission, if made tactfully and in a spirit of helpfulness and co-operation, will generally be cordially and gratefully welcomed.

It is harder for the intermediate teacher to visit classes in the high school; but it is wise administration for the intermediate principal to provide some opportunity for each of his ninth grade teachers to visit both ninth and tenth grade classes in the high school. There should be a very friendly and intimate acquaintance on the part of ninth grade teachers in both high and intermediate schools, first, with one another, and secondly, with the eighth grade teachers who prepare their pupils, and the tenth grade teachers who are to receive them.

I was somewhat surprised at Mr. Gould's figures with reference to the attendance of high school teachers and grade teachers at promotional and improvement courses recognized by the School Department, and of especial interest to Grades VII, VIII and IX. I believe that there were 110 high school teachers and 1520 grade teachers credited with such courses, while in such courses now being given there are enrolled 7 high school and 388 grade teachers. There may be satisfactory reasons for this; the courses may have been more suited to the needs of one group than to those of the other; the burden of correcting papers and preparing for classes may be greater for the high school teacher or he may be studying elsewhere; competition for promotion may have exerted a greater pressure on the grade teacher; but I fear that one reason for the discrepancy may be that the high school teacher, after taking his degree and getting an appointment, feels pretty well satisfied with his achievement and regards it as unnecessary and somewhat beneath him to be taking further courses and continuing to sit at the feet of instructors. He should remember that the man who ceases to be a student soon ceases to grow as a teacher.

One of the best things a principal can do is to talk now and then with his younger teachers about what they are doing for their professional development. I consider it no less than a duty for the high school principal to insist that his ninth and tenth grade teachers who receive pupils from intermediate classes shall visit the schools from which these pupils come, and meet the teachers who have prepared them.

The high school Head of Department also has an important part to play in getting the right contact between the two schools. It is well worth while for him to devote each year one of his department meetings to a report of what his teachers have observed in their visits to the intermediate and elementary schools which send him pupils, and to a discussion of how the mutual relations can be made closer and more helpful.

I have said nothing about the adjustment of the high school to the college. Probably nothing needs to be said. In the past there has been altogether too much of this adjustment of the lower grade to the higher. The present tendency, as recently stated by Professor Koos, is to insist that the adjustment be chiefly from above downward, and not the other way, as heretofore. We cannot, however, disengage the high school entirely from the college, nor is it desirable that we should. As long as one function of the high school is to prepare for college, the college people have a right to say something as to the kind of preparation they prefer; and there is no doubt that they will continue to exercise this right, and to state in no uncertain terms what they require. They have already recognized, however, that the college preparatory function is not the only, or even the chief business of the general high school, and that even the Latin schools must adapt their instruction to the age and natural interests of the pupil, bearing ever in mind such great objectives of education as sound physical development and civic and social usefulness. The colleges may properly state their requirements, but the high school must decide how far it can meet these requirements without sacrificing higher interests of the child.

To summarize:

High and intermediate teachers must feel themselves coworkers of equal importance in one great system.

Each group must seek to know intimately the work, problems, and methods of the other.

Principals and department heads must do all in their power to promote this intimate acquaintance.

All concerned must make it a point of honor to know thoroughly and to follow exactly the courses of study outlined for various subjects.

Adjustments must in general be from above downward. While a teacher's success will always be estimated in large measure by the way in which his pupils stand up to the work of

the next grade, his wisdom and good judgment will appear in the way he adapts his instruction and his requirements to the attainments and capacity of pupils as he finds them.

We need make no plea for unifying the work and methods of the high school with those of the college. The latter can be trusted to speak for itself in tones that will command attention, and will always secure proper consideration for its demands.

REPORT OF THE CHIEF EXAMINER.

Mr. Jeremiah E. Burke,

Superintendent of Public Schools, Boston, Mass.

My Dear Sir:—In accordance with your request, I herewith submit a report upon the work of the Chief Examiner.

In the report of the Superintendent for the school year 1918–1919, Mr. Thompson called attention to the constantly increasing burdens of the Board of Superintendents and recommended the appointment of a Chief Examiner, who should assist the Board, by taking charge, under its direction, of the various teachers' examinations given in the city and by performing such other duties as might be assigned him. Mr. Thompson's recommendation was accepted, candidates for the position were asked to submit their names and qualifications, a competitive list was prepared, and in the Fall of 1919 I was appointed to the position, taking office on November 15.

My work in connection with examinations may be considered under the following heads:

I. Examinations.

A. *Determination of Eligibility Requirements.*

The qualifications for admission to the certificate examinations are laid down in the rules and regulations enacted by the School Committee and explained in the Circular of Information. Eligibility for any certificate is determined by the Board of Superintendents in accordance with the rules and regulations. Up to the time when I was appointed Chief Examiner, the preliminary work had been done by the Committee on Eligibility, consisting of two members of the Board of Superintendents. It has been my duty to investigate the qualifications of each candidate, and to report thereon to the Committee on Eligibility. Most cases can be settled thus, requiring simply formal approval by the Board of Superintendents, others have to be carefully examined and discussed by the full Board.

B. *Certificate Examinations.*

The principal examinations have ordinarily been given once a year, at the end of January. Other examinations are held in

June and in September. For the general examinations it is necessary to prepare about 350 separate papers. It has been my duty to have these papers prepared, revised, corrected and printed. After the examinations the papers have to be corrected and graded, and the results have to be checked and tabulated. The credentials of each candidate have to be inspected carefully in order to see that the claims for qualification have been proved. When this has been done the rating sheets pass to the Board of Superintendents in order that the credit for experience may be determined, and the final rating established.

All of the work connected with the preparation of papers, reading of proof, conducting the examinations, etc, formerly was done by the Board of Superintendents through its special committee on examinations. The Board of Superintendents still assumes full responsibility for all examinations, but all of the preliminary work, and an increasing amount of responsibility in conducting the examinations, have been assigned to the Chief Examiner.

C. *Promotional Examinations.*

Every regularly appointed teacher in the city is required to pass a first promotional examination before the second anniversary of appointment, and a second examination before the sixth anniversary. These examinations are held twice a year, in May and in December. Each candidate is given suitable notice of the date of his examination and except in the cases of a few relatively large groups, a special question is prepared for him. As the number of candidates for examination sometimes exceeds two hundred, for many of whom individual questions must be provided, the preparation of the examination papers demands considerable time and care.

The promotional requirements were formerly in charge of one member of the Board of Superintendents. Of these requirements, the examination forms only a small part. Professional study, professional reading, improvement in the technique of teaching, all have to be provided for and evaluated by the Board of Superintendents. By assigning the details of the examination to the Chief Examiner, more time has been at the disposal of the members of the Board for those aspects of the promotional requirements which they alone are com-

petent to deal with, and which must necessarily be left entirely to them.

D. *Minor Examinations.*

Under this heading may be included the examinations held in June and September for admission to the high and Latin schools, for admission from high schools and from college to the Normal School, the examinations for junior assistants, etc. This office has taken charge of the preparation and printing of the question papers and of conducting the examinations as required.

E. *Review and Revision of Examinations.*

It occasionally happens that candidates are dissatisfied with the grades received and wish to go over their papers. It has always been the policy of the Board of Superintendents to grant this privilege. The procedure offers no serious difficulty, for papers are graded and checked very carefully in the first place, but it does consume a great deal of time. The practice is at present for the Chief Examiner to give the candidate an opportunity of examining and discussing the papers informally. If the candidate is satisfied, this settles the case. If not, the candidate requests a formal review. In this event, the special examiners are called in and the papers are reviewed in the presence of at least one member of the Board of Superintendents. Very few cases have required formal revision, but the Chief Examiner has had to go over a number of papers informally. The time is well spent in that the candidate is generally satisfied that the rating has been just.

F. *Date of holding the Certificate Examinations.*

During the last few years the chief examinations have been held in January. As the candidates are then allowed a considerable length of time in which to file credentials, the compilation of the eligible list is delayed, and teachers cannot be informed whether there is a possibility of appointment until long after the date for renewing contracts with their present employers has arrived. What is more, it frequently happens that several candidates take the examination only to be declared ineligible later. The time and expense of unnecessarily examining such candidates are wasted. It is to be noted also that

under the present system many good teachers refuse to present themselves for examination because they are unwillling to ask for leave of absence to take the Boston examinations. These facts were well shown by the quality of the candidates who took the examinations on April 29, of the present year. Several excellent candidates said plainly that they would not have taken the examination if it had taken place on a school day. It is, therefore, a cause for congratulation for all concerned that the School Committee has recently approved changing the date of the general certificate examinations from January to December, during the Christmas vacation of the Boston Schools. Under the new ruling, the next general examination will be held in December, 1922.

G. *Admission to Examinations.*

Under present conditions we advise candidates to submit their credentials before the date of the examination in order that the question of their eligibility may be passed upon in advance. Candidates may, however, simply present themselves at the examination hall, state which certificate they desire, and be allowed to take the appropriate examinations. Many candidates are later found to be ineligible. This procedure leads to dissatisfaction on the part of the candidate and entails a large amount of unnecessary correspondence on the part of the Board of Superintendents, and delays the preparation of the Eligible List. It is greatly to be desired that after suitable notice the examinations should be closed to all candidates who have not proved their qualifications in advance. Admission to the examinations should be granted only to those who present tickets of admission, granted by the Board of Superintendents.

H. *Changes in the Method of Preparing Examination Questions.*

The method which has been followed for many years has on the whole worked well. The policy has, however, been started, of having certain sets of papers prepared by a group of experts, rather than by a single examiner. In this way it is possible to prepare better balanced papers and to determine in a broader way just what the city examinations should stand for. It is intended to develop this policy still further during the coming year.

II. The Rating of Candidates for Promotion Within the Service.

The origin and early history of the plan of establishing rated lists for the promotion of teachers already in the service to higher positions were clearly presented by Mr. Ballou, at that time Director of the Department of Educational Investigation and Measurement, in School Document No. 2, 1918. From this document it appears that plans for inaugurating the policy of making appointments to higher positions in the service solely from merit lists had been under consideration in 1914, and that these plans had to some extent been put into effect. During the following years, and especially during the administration of Mr. Thompson, the earlier plans were extended with the intention of placing the entire school system upon a strict civil service basis.

Without attempting to indicate all of the merit lists that have been prepared in the last few years, it may be stated that during the last school year rated lists have been made of candidates for appointment as high school headmaster, head of department of English in high schools, master's assistant, first assistant, grammar, first assistant in charge, and first assistant, kindergarten. For each list, suitable forms have been prepared for the recording of items to be credited and rating sheets for the evaluation of the various items. Each candidate for rating fills out the proper form, listing such items as in his or her opinion are worthy of credit, and submitting the evidence. On the basis of the candidate's own statements and of other factors to be indicated below, the rating is made.

The principal items for which credit is given are as follows:

I. Educational preparation.
II. Teaching experience.
III. Administrative and executive experience.
IV. Professional interest and growth.
V. Professional co-operation.
VI. The candidate's standing as a teacher in the city service, as estimated by principals, supervisors, and superintendents.

Minor Items are:

VII. Professional reading.
VIII. Educational associations.
IX. Outside activities, including travel.

Most promotions made in the city service are to positions of greater administrative or executive responsibility, but the positions differ so widely in their duties and requirements that no one rating plan could possibly be devised adapted in all its details to all or even to several rated lists. The standard set and the credit given under each of the headings listed above are necessarily varied, in accordance with the nature of the position for which the list is prepared. Hence, separate rating plans, blanks, and sheets have been prepared for every list which has been established.

The preliminary work in the preparation of the various rating plans and rating sheets has, in general, been done by Assistant Superintendent Gould and myself. The plans have then been discussed, amended, revised and completed by the entire Board. The evidence submitted by the candidates has been collected, arranged and tabulated by the Chief Examiner. After a preliminary evaluation of credits by a sub-committee of the Board, the complete files have been examined and the tentative ratings revised and corrected by the entire Board. From the list as thus finally approved, appointments to vacancies have been made.

The above bare outline of procedure fails to indicate the amount of time and work required to prepare the lists. No effort has been spared to arrive at absolutely just conclusions, and to prepare lists which should merit the confidence of the entire school system. No other American city has attempted the application of civil service principles on so broad a basis. The details of the plans adopted are as yet to be considered as tentative. Experience has shown where various modifications were necessary. These have been put into effect or will be as need arises.

The basic principles to be followed in establishing a rating scheme were laid down by Mr. Ballou in the School Document already referred to (School Document No. 2, 1918). They may be summarized as follows:

1. The basis of the ratings should be known.
2. The elements constituting the common basis should be carefully defined.
3. The methods of recording observations should be as simple as possible.
4. The scale for indicating the varying degrees of merit should be such as to indicate a small group of especially competent people.
5. An adequate method for handling the records in the office is essential.

The only point above calling for special comment is the first. As a matter of fact, the basis of the ratings is known, and in general the basis has been established by consultation with those who are directly affected by the rating, and in revising the rating schemes their criticisms have been given due attention. Furthermore, every teacher rated has the right to receive an explanation of her rating and to ask a revision if the rating appears unjust. A point which Mr. Ballou did not mention, but which is of considerable importance, is that the rating plan should be such that high grade candidates should not receive an humiliatingly low rating. This is likely to be the fault of any first draft of a rating plan. Experience only can show how to establish bases and assign credits in such a way as to properly differentiate among varying degrees of merit and to assign credits therefor.

Any rating scheme is valueless unless opportunity be afforded candidates to qualify under the various heads. The Board of Superintendents has endeavored to open up the field for gaining executive experience—necessarily somewhat limited—as widely as possible in order that the largest possible number of competent candidates may have adequate opportunity of proving their ability.

The advantages of the merit system of promotion, when it has been thoroughly worked out, may be thus stated:

1. It throws open the opportunity of promotion to all properly qualified candidates in the service.
2. It removes the danger that promotion may be based upon caprice or favoritism.
3. It frees the Board of Superintendents and the School Committee from the pressure brought to bear upon them by outside individuals, who, no matter how well-intentioned, often have scant understanding of the needs of the school service, and who lack acquaintance with the whole number of qualified candidates in the school system.
4. It puts the responsibility for promotion squarely upon those seeking it. Their claim for recognition must be based upon the record of their service.

III. Miscellaneous Assignments.

A. *The Authorized List of Textbooks.*

The five-year period of constantly mounting prices through which we have just passed has been full of difficulties for both publishers and purchasers of textbooks and educational materials. It has unfortunately been necessary in many cases to

suspend temporarily the purchase of certain books and materials, duly authorized and desirable in themselves, but which could be dispensed with for a time. This has been at times embarrassing both to the schools and to the publishers, but has, in general, been accepted in a fine spirit of co-operation on both sides.

Soon after my appointment I was instructed by the Board of Superintendents to make a comparative study of the textbooks in use and to make definite recommendations to the Board of Apportionment as to the continued purchase or the suspension of the items considered.

The principles to be followed were:

1. The work of the schools must not be hampered.
2. The city must get the best value for its expenditure.
3. Publishers must be squarely treated.

It has been a matter of considerable difficulty to meet the three demands and the results have frequently been unsatisfactory to all concerned. However, the work has been done on the basis of independent examination and of the best advice I could get from officials and teachers. I believe it is fair to say that a considerable saving to the city in its purchases of books and educational materials has been effected. Many textbooks are now showing a reduction in price, and the time has arrived for a thorough study of the whole situation and the preparation of a new Authorized List.

B. *Other Activities.*

The remainder of my time has been largely occupied with editorial work. For example: at the direction of the Board of Superintendents I prepared the Report on Modern Language Work in Boston High Schools (School Document No. 2, 1920) and had a large share in the preparation of the Report on Intermediate Schools, published as School Document No. 15, 1920, and of the Statement of Principles and Procedure, etc., published as School Document No. 2, 1921.

I have continued my work with the Council for Modern Foreign Language and have assisted in preparing the Revised Course in French and Spanish, published as School Document No. 15, 1920, and the Revised Course in Italian, School Document No. 9, 1921.

Without entering into further detail, I may say that my work

has been such as to bring me into contact with many branches of school activity.

To the Board of Superintendents, I desire here to express my appreciation of the courtesy and kindness with which they have assisted and guided me in the work of this new position.

Respectfully submitted,

JOEL HATHEWAY,

Chief Examiner.

REPORT OF THE PRINCIPAL OF THE CONTINUATION SCHOOL.

MR. JEREMIAH E. BURKE,

Superintendent of Public School, Boston, Mass.

MY DEAR SIR:—In accordance with your request, I herewith submit my first report on the Compulsory Continuation School for the year 1921–1922.

The general depression in business during the year has greatly made itself felt throughout the school. The enrollment from month to month is a reflection of conditions in industry especially as they pertain to the fourteen to sixteen year old workers upon whom the Continuation School depends for its existence.

The following table will show the comparison between the enrollment and the discharges, the latter taking place automatically at sixteen years:

ENROLLMENT:

Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
567	468	290	165	368	160	312	190	264	246	3030

DISCHARGES:

Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
350	467	384	397	471	324	401	279	383	327	3783

The smaller enrollment per month is due to several causes: 1st, the praiseworthy movement of principals to keep children in the day schools; 2nd, employers refusing to take in children under sixteen; 3rd, and perhaps the greatest reason, the considerable number of boys and girls over sixteen years of age who, by law, are permitted to work nine hours a day, with no attendance at the Continuation School, and who are willing to work for practically the same wages as would be paid 14 to 16 year old boys and girls. As business improves, this over-sixteen-year-old group will find better opportunities at higher wages, thus leaving the positions which they now hold for the Continuation School child. Then, undoubtedly, the numbers in the school will return to normal. This total should be in the vicinity of four thousand.

From the outset the teachers strive to impress upon the pupils the first lesson of the Continuation School. It is to

make them realize that although they have left the day school their education is not completed and that they must cultivate the habit of studying and working at the same time.

To accomplish these things the teachers first of all have to adopt new methods of instruction. The text book, as it is used in the day school, is put aside, and single lesson sheets based upon the individual differences of the pupils, are used. It is only in this way that the teacher can know and satisfy the real needs of the pupil and influence him by his personality. Old methods must be discarded in the main, and a new method of individual instruction be worked out. The test of this new method is the success of the teacher in reaching each member of the class and inspiring him to make definite progress.

All the foregoing ideas find their expression in the Continuation School as it exists to-day. By this, it is not meant that perfection has been reached, but that the teachers are imbued with the spirit of service and brotherliness for the children under their care and are using all means now obtainable to accomplish the aims of the school.

One of the principal aids to this accomplishment is the "follow-up" work of the teachers to the home and places of employment of the child. Visiting the home the teacher endeavors to acquaint himself with the environment of the child in the neighborhood and in the home; his books, companions and amusements, and how he further spends his leisure time. He gets the parent's viewpoint of the child, of his capacities, preferences and his (the parent's) desire, if any, of a choice of vocation for him. By these visits hearty co-operation of parents is obtained, attendance is improved and discipline made easier. The parent realizes that the teacher is sympathetic and desirous of helping his child, that he comes as a friend and adviser rather than as an officer of the law.

At the place of employment the teacher endeavors to obtain information concerning the child's work and his chances for promotion in business, and at the same time he seeks to establish cordial, co-operative relations with the employer. The information thus obtained is used by the teacher the better to prepare the young worker for his promotion, while the co-operative relations are made the basis of a better understanding of the school by the employer, who is made to see and believe that the school can be an asset to him in his business because it is able to give the worker a better appreciation and applica-

tion of the virtues which go to make him a more industrious and competent citizen.

In order to get information from the employers in addition to that obtained from follow-up work, a questionnaire was sent to those with whom co-operative relations have been established. It contained the following queries:

1. What qualities necessary to their work do your fourteen to sixteen-year-old workers lack?
2. Which of the following subjects would you have stressed in the Continuation School, and which of the following qualities would you have us develop in order that these young workers may be of more value to you in their present work?

Bookkeeping	Office Practice	Typewriting
Salesmanship	Dressmaking	Electrical
Mechanical Drawing	Machine	Household Arts
Millinery	Power Machine	Printing
Sheet Metal		Woodworking
History	Arithmetic	Penmanship
English	Civics	Hygiene
	Commercial Geography	
Faithfulness	Honesty	Reliability
Neatness	Punctuality	Courtesy
Initiative	Application	Industry
Thrift	Obedience	Loyalty
Ability to follow directions		Willingness

(N. B. Check subjects approved by you.)

3. Would you suggest other subjects and qualities that may be added to our program?
4. Would you write any criticisms which will assist the Continuation School to make these young workers better citizens and more efficient workers?
5. Would you indicate the next logical step of promotion for Continuation School pupils in your employ?
6. What training can the Continuation School give to help in gaining this promotion?
7. If convenient for you would you care to see the Continuation School in operation if satisfactory arrangements could be made for it?
8. Do our pupils go back to their employment with a better attitude towards you and their work after attending Continuation School?
9. On the whole, are you in favor of a Continuation School?
10. The Continuation School maintains an employment department which renders excellent service to employer and is of no cost to the children.
    (*a*) Have you hired any workers from our employment department?
    (*b*) Are you satisfied with its service?
    (*c*) Will you give any suggestions which will make this department of greater service to you?

11. If you have received correspondence, telephone calls or personal visits from the teachers of our school, would you suggest anything along these lines, which might be of benefit to the employers and school?
12. In the entire conduct of the school would you make any other suggestions which would enable us the better to serve the employers of Boston?

The answers brought forth many interesting points of view concerning the things that the school failed in as well as those in which it succeeded. Among all the qualities that boys and girls might have, a large number of employers found the following generally lacking in their employees:

Neatness, a sense of responsibility, initiative, willingness, reliability, ambition, real interest in the work, ability to follow instructions, punctuality and general intelligence.

Employers think the Continuation School should teach the following topics to their employees:

Elementary economics such as over head expenses, cost of labor, etc.—The results of having competent labor.—Relation between the cost of labor and cost of finished product.—The technical terms of various trades.—Telegraph correspondence in connection with commercial work.—Postal rules and regulations.—The advantages of becoming a skilled mechanic.—Lectures on the manufacture of various commodities.—Study of the Port of Boston and suburbs from a business standpoint.—Location of its industries and methods of transportation.—Ability to express themselves clearly and concisely.—Any kind of handiwork to increase dexterity and accuracy.—Emphasize training for citizenship.—Love of Country.—Respect for laws.—Industrial hygiene.

What employers desire taught is further illustrated by the following quotations:

"Gymnasium if possible, or something to help their general physical condition." "Stimulate ambition—it is distressing to see the terrible lack of this quality." "Impress upon their minds that there are more good positions awaiting for ambitious persons than there are such to fill them." "Teach them the dignity and importance of work." "The outstanding characteristics of these young workers is that they do not know *how* to work, not that they do not want to, but naturally and simply that they are just beginning in the work-a-day world. It is a new experience to them to which they must become adapted." "Teach them respect for authority and elderly people." "Teach them the benefits of good companions." "How to choose friends." "Teach them the value of sleep, they seem to be tired all the time." "Teach them to give up smoking, there is too much cigarette smoking." "Warn them of the dangers of bad companions, corner gang, etc." "If the Continuation School can offset the demoralizing influence of bad associates, it will do a wonderful thing." "Ground the pupils in the fundamentals of general education." "Give

a series of short talks by business men." "Teach discipline." "Series of very concise illustrative lectures." "Urge night school attendance." "Develop personal relations between teacher and pupil to discover fitness for particular job." "Establish a Vocational Guidance Department in the Continuation School." "Brace up the weak spots in the three R's by practice and review." "Teach them how to use the telephone and use the telephone book." "Interest them in home study, give home lessons and assignments." "Interest them in public libraries and the use of good books."

One of the most difficult problems in the Continuation School is the out-of-work class. The law requires that unemployed minors between 14 and 16 years attend either the day school or twenty hours a week at the Continuation School. This is the source of the greatest number of absences in the school. The lack of money to pay car fare is the principal reason for non-attendance. It is my belief that this difficulty may be largely overcome by supplying car tickets to those required to attend the out-of-work class.

There is a definite aid in building up the attendance at this class. It is the department for the establishing of co-operative relations with employers. These relations are in an extremely flourishing condition in both the boys' and girls' divisions. Literally, hundreds of employers now know that it is possible to telephone to the school when boys or girls are needed and that in the out-of-work class may usually be found the particular type necessary to fill the particular vacancy. This does away with the necessity of going to a private employment agency which takes an entire week's pay from the child for finding the position. During the past year many thousands of dollars have been saved to the young workers of the city and at the same time the employers received boys and girls selected with a view to their fitness for the position offered. This department is of great assistance in bringing the business men of the city to a realization of what part-time education can accomplish for their young employees.

This leads to the discussion of the question of part-time education in general and what can be done in four hours a week at school in particular.

The rapid spread of Continuation Schools, following the lead of Boston, shows that educators of to-day realize that in the great army of adolescents who leave school at or about fourteen years of age lie great potential powers for good or

destruction. This army forms a considerable part of the great working class of the country in whose hands are placed its destinies. What an enormous power for good is the school which takes this multitude into its sympathetic and understanding embrace, furnishes men and women of experience in school and shop to guide them through the most difficult period of their lives, awakens ambition, leads them to make sure judgments, helps direct them to an accurate choice of vocation, and above all, makes them realize the sacredness of toil with its responsibilities and its rights, and the reward that comes with labor well performed—a serene and contented old age!

But the end is not yet in sight. Until laws are made by virtue of which the young workers of our country are enabled to spend one week at school, and the next at work—from fourteen to sixteen years of age, at least—our duty to the youth of our land is not done. But day by day the beacon beams more brightly to our vision and in the comparatively near future we can hope to see the full light of the day of its accomplishment.

In regard to the present hours of attendance in the Continuation School, the question is often asked, "What can the pupil learn in four hours a week?" A visit to the school will provide the best answer to the question—a quick, comprehensive and satisfactory one.

If that be impossible the following picture may be drawn. Given a small number of pupils grouped according to their individual differences, their particular choice of subject or academic grade. In the Boys' Division, the work may be in any one of the following departments:

Machine Shop Work
Woodworking
Sheet Metal Working
Printing
Mechanical Drawing
Electricity
Bookkeeping
Typewriting
Office Practice
Salesmanship
General Academic Work

In the Girls' Division:

Dressmaking
Millinery
Power Machine
Cooking
Home Making
Bookkeeping
Typewriting
Office Practice
General Academic Work

In each class two hours are devoted to academic work, including English, Civics and Hygiene, and a discussion of the problem to be worked out in the shop. The following incident will serve to illustrate the latter point:

In the sheet metal class a pupil was industriously working out an example in multiplication of fractions. After it was finished, a short conversation with the boy brought out the illuminating fact that a similar example done in an elementary school would receive a "c" from the teacher if the answer were correct. In the Continuation School the correct working out of that problem together with associated ones would in the shop find its material expression in a bread box for the mother of the boy. And so in all the departments, the pupil brings his labors in the academic classroom to fruition in the shop correlated with it. This may take the various forms of a table, step ladder, chair, dress, hat, or a jar of preserved vegetables, a radio outfit, a neatly typewritten page, or an ash barrel.

However, the real value of the school does not lie particularly in these material accomplishments. It lies in the light and strength that it gives to the pupils, enabling them the more clearly to see and follow the pathway of duty as it winds its narrow way through the years that face them. Herein the Continuation School must succeed or fail. That it is succeeding in Boston is the conviction of those most closely connected with it—the teachers who watch and guide the progress of the adolescent youth who pass through it and out into the active life of the work-a-day world.

Respectfully submitted,

PAUL V. DONOVAN,

Principal of the Continuation School.

REPORT OF THE DIRECTOR OF MEDICAL INSPECTION.

Mr. Jeremiah E. Burke,

Superintendent of Public Schools, Boston, Mass.

My dear Sir:—I herewith submit the following report of the Medical Inspection Department, Boston Public Schools, for the school year 1921–22.

At the urgent request of the Director of Medical Inspection, the School Committee granted permission for the introduction of the Schick test in the schools in October, 1921.

Impressed with the advantages of the Schick test for the prevention of diphtheria, the Director of Medical Inspection recommended its adoption in two districts. The School Committee approved this recommendation in November, 1921.

Dr. Solomon H. Rubin, school physician in the William Lloyd Garrison and George Putnam Districts (enrollment about 2700 pupils) was assigned to this work. Suggestions for the cards and record blanks were taken from the New York system.

Local physicians were informed of the proposed work and its advantages, and 1500 circular letters were sent, through the children, to the parents, advising them in regard to the Schick test, and requesting consent for its application to their children.

A mothers' meeting was held in the William Lloyd Garrison School at which Dr. Edwin L. Place, Superintendent, South Department, Boston City Hospital, described the Schick test and its advantages. Dr. Ceconi, representing the Health Department, co-operated.

Arrangements were made with the Master of the George Putnam District for the application of the Schick test to children bringing written permission from their parents or guardians. A teachers' meeting was held on December 21, 1921 at which there was discussion of the work, and the full co-operation of the teachers was assured.

In the William Lloyd Garrison District, less than 50% of the parents gave their consent. This may have been due to several factors, such as the indifference on the part of the parents and the fear of consequences. Some parents who were either un-

acquainted with the work, or who feared the consequences, were later willing to have their children Schick tested. The wishes of the parents have always been respected. In a few instances, parents were unwilling to permit the second inoculation and in some cases they would not permit immunization after the Schick test had been performed.

There have been very few instances of illness resulting from immunization by toxin-antitoxin. Headache, malaise, fever, local redness, and induration at the point of inoculation, also pain in the immunized arm occurred in a few cases. Toxin-antitoxin has been given, with no after-effects, to children showing organic lesions of the heart. It has been demonstrated that the younger the child, the more likely he is to endure without consequences the toxin-antitoxin.

The fact that there are 373 positive reactions against 148 negative in a small group of 531 children Schick tested in the William Lloyd Garrison District, indicates the value of this testing. The cases of diphtheria that have been reported in this district were cases that if Schick tested would show a positive reaction.

Some local physicians have advised parents against the Schick test. On the contrary, a large number of physicians whose children attend the William Lloyd Garrison school have requested that their children not only be Schick tested but that they be immunized, a manifestation of confidence in Schick immunization.

The Director of Medical Inspection believes that the introduction of the Schick test will, in a few years, practically eradicate diphtheria. He questions the advisability of the school authorities adopting this test in all of the schools, but its success in one district will demonstrate to the public its importance in the prevention of diphtheria.

After the family physician has used this method for several years on children of pre-school age, few cases will be discovered in our classrooms.

The benefit to the public will repay the School Committee for the time and money expended in this preliminary testing.

The following is a copy of report of Dr. Solomon H. Rubin, school physician, who performed the tests:

Complying with your request I herewith submit my report of the work of Schick Testing and of inoculating with toxin-antitoxin the pupils of the William Lloyd Garrison and George Putnam Districts. These two

districts only have been treated, and the statistics herein presented are based on findings in these districts.

The Schick Test is a test of susceptibility. It determines accurately the presence or absence of a natural antitoxin against diphtheria in the body fluids and tissues. The procedure of Schick-Testing is simple, harmless and practically painless, and the result is accurate if properly read. It consists of the intracutaneous injection of .02 c.c. of diphtheria toxin. In about four days there appears at the point of inoculation an area of redness of the size of a 25 cent piece, which is followed by desquamation and pigmentation, the latter persisting several weeks. Such a reaction is termed a positive reaction, and it signifies that the person so reacting is susceptible to diphtheria. If no reaction appears that person possesses in his body fluids and tissues sufficient natural antitoxin to neutralize the toxin of the diphtheria germ. Such a person cannot contract diphtheria if exposed to the disease. Other reactions, namely; the pseudo and combined reactions may result from toxin inoculations, but its significance, although important, is not a topic for consideration in this report.

Persons who give a positive Schick reaction may be rendered immune by active stimulation of their tissues with toxin-antitoxin specially prepared for this purpose.

Toxin-antitoxin is harmless. It should be administered every week successively for three weeks. Immunity is established in from six to eight months after the administration of the third inoculation. Although this is the general rule, some cases require a second series of inoculation to establish immunity. The period of immunity, so far, has been six years, and according to reliable observers, theoretically immunity should be permanent. Some children become immune in about four months.

To make certain that a person treated with toxin-antitoxin is immune, it is necessary to retest that person in from six to eight months after the first series of inoculation has been administered. Statistics show that from 80–90% of artificially immunized children give a negative Schick reaction. As stated above, those who persist in yielding a positive reaction after the first series of inoculation should be subjected to a second or third series of inoculations with toxin-antitoxin until a negative Schick test is produced.

Briefly, this describes the process of Schick-Testing and of active immunization with toxin-antitoxin as it has been carried out on the pupils of the William Lloyd Garrison and George Putnam Districts.

At the present time, active immunization against diphtheria is being practiced throughout the United States, in the Army and Navy and in certain parts of Europe.

The general use of this method of diphtheria prevention will result ultimately in the eradication of the disease from public schools, and if carried out in children of pre-school age and in adults the disease should become extinct in the course of time. When it is considered that thousands of children annually die from diphtheria and many suffer permanent damage as a result of the disease, this method of diphtheria prevention should be universally adopted.

Before the children of the aforesaid districts were Schick Tested, their parents were requested to attend mass meetings held in the William Lloyd

Garrison and George Putnam Schools. Dr. Edwin H. Place of the Boston City Hospital and Dr. Benjamin White of the State Health Department addressed the parents, demonstrated the Schick Test upon themselves, and explained its purpose, its harmlessness, and assured them of its usefulness as a preventive measure against diphtheria. Circular letters were addressed to all physicians of both districts. These letters explained the method and object of the Schick Test and requested their co-operation. This was done to insure complete co-operation from the profession, especially since it was expected that parents would naturally turn to their family physicians for advice.

Consent cards were prepared and these were distributed among the children attending schools of both districts. No child was tested or immunized without the written consent of the parent or guardian. About 40% of the school population returned signed consent cards, the remaining 60% refused to avail themselves of this preventive measure and this was due to several motives, the most prominent of which are as follows:

1. Inertia.
2. Indifference.
3. Fear.
4. Lack of confidence.
5. Pupils' objection.
6. Ignorance.

The administration of the test to several hundred children without a single mishap did much to restore the shaken confidence of the public of that community. Later even some of the most obstinate outstanding skeptics expressed their desire to have their children tested and inoculated. But since it was impossible to return to classes already treated these children were advised to consult their family physicians. This undoubtedly is responsible for the small number of children treated in our series.

The paraphenalia used in the performance of the test consisted of standard equipment, improved and modified to suit our needs. Every needle and syringe used in this work was sterilized by boiling. The children's arms were cleansed with suitable antiseptic solutions. The diphtheria toxin and the toxin-antitoxin employed in our work was prepared for us by the antitoxin laboratory of the State Department of Health. Not a single ampoule produced deleterious results. Every lot used had been tested in the antitoxin laboratory, before it was used.

Children were tested by classes and readings were made on the fourth day after inoculation. Because of other duties of the school physician and the school nurse, it was not possible to see every child tested, daily. In this way many pseudo and combined reactions were lost which explains the unusually small number of children giving such reactions. The administration of toxin-antitoxin to children who have manifested local reactions, consisting of swollen arms and general reactions such as headache and fever, undoubtedly showed a protein reaction which was lost to us on the fourth or fifth day.

Children frequently absented themselves from school on account of these slight and inconsequential after effects, but investigation proved that those children suffered more from fear than from pain or discomfort.

Parents have shown commendable cooperation, seldom complaining and only occasionally inquiring of the school physician if the child's indisposition is of any serious consequence. Reassurance, however, was all that was necessary to remove any objections they might have raised.

The school nurse followed up every case of reported illness among the tested or inoculated children and in almost every instance the illness was not due to the toxin-antitoxin, and certainly not to the toxin used in Schick Testing. The nurse also kept the records, visited the children in classrooms, held conferences with parents and noted the degree of local or constitutional disturbance, if any resulted in inoculated children. It has not been possible to follow up many children who were tested and who received one inoculation but who remained absent from school for other reasons. On their return to school, they were given their over-due injections. Such children received their toxin-antitoxin injections at longer intervals than the usual period allowed to elapse between injections. According to Dr. Zingher of New York, who is carrying on this work in the New York Schools, there is a distinct advantage in longer intervals between injections. He believes that longer intervals between inoculations "has the advantage in allowing the local reaction to disappear more completely before the next injection of toxin-antitoxin is given. There may also be a better antitoxin response when the injections are given two weeks apart."

The question of anaphylaxis has naturally been raised by physicians practising in the school districts and our reply, in the beginning, has been a reassurance against such mishaps. While this confidence was inspired by reports from other cities our own experience confirms these reports.

Physicians and parents frequently objected to the administration of toxin-antitoxin to children who, they said, were suffering from heart disease, anemia, general debility, or 'weakness.' We have found no ill results from the inoculation of toxin-antitoxin in definitely established cases of organic heart disease, bronchitis, asthma and certainly no bad effects were produced, as a result of the injections, in children who were supposed to be 'run-down,' 'anemic,' or 'too weak' to receive these inoculations, according to letters received from physicians and parents. In other words, we found no definite contra-indications to the Schick Test and to the administration of toxin-antitoxin.

It has been noted above that we have administered three inoculations of one c.c. of toxin-antitoxin to each positive and combined reactor. Experiments with two inoculations of 1.5 c. c. of toxin-antitoxin has been carried out by Zingher with a view to simplifying the whole procedure, but his conclusions are in favor of the administration of three injections of toxin-antitoxin one week apart. This has been our practice and it will be the course we expect to follow if this work is permitted in the schools next year.

We have administered 1812 injections of toxin-antitoxin to the children in the William Lloyd Garrison, Williams, Walnut Avenue Kindergarten, George Putnam and Ellis Mendell Schools.

The population of these schools is 2649 children of which 979 children consented to be Schick Tested and immunized if they were positive reactors.

The comparatively small number of 'consents' received is due to many factors. First and foremost is the lack of publicity which the diphtheria-prevention-campaign suffered and which should have been extensively carried out if so radical an innovation as the association of slight pain and discomfort with school work was to be successfully introduced in Boston Public Schools. Locally, our campaign of publicity has been as extensive as was permitted by the department, but it was not sufficiently far-reaching and not as effective in securing large consent returns as it would have been if the press had been enlisted in our cause. Fear on the part of parents is a second factor responsible for the small number of consents obtained. The other factors are noted above. Public reassurance from the School Committee, and from the Department of Medical Inspection, through the press, together with statistics from other cities would have swelled our numbers. I earnestly recommend the urgent need of an active and far-reaching publicity campaign, similar to that carried on in other cities, if Diphtheria prevention is to be introduced in the Public Schools of Boston on a much larger scale. If the work in the William Lloyd Garrison and George Putnam Districts was a test of public opinion, the results obtained would warrant the extension of the work throughout the entire school system.

If 37% of the school children of these two large school districts were willing to be protected against diphtheria there is no satisfactory reason why that number should not be raised to 100% if parents could be reached in some suitable and effective manner.

It may be stated here, that the campaign of diphtheria prevention in the William Lloyd Garrison and George Putnam Districts has stimulated local physicians to carry on this work among pre-school children as well as among school children who prefer that their own physicians should test and inoculate them. We have always encouraged children to seek treatment along these lines from their own family physicians. If this work will be carried out by private physicians in their own practice and by the schools, diphtheria will soon be placed in the category of rare and extinct diseases.

The grades examined were from kindergarten to the ninth grade. The ages of the children were from four to sixteen years. It should be noticed in the following table that the ages in the lower grades are much higher than they should be for those grades. This is due to the admission of older children into the lower grades who have come from foreign lands.

Of the 979 children tested, there were 506 boys and 473 girls. The number of positive reactors were 266 boys and 300 girls, a total of 566. There were 22 combined reactions but this number is not accurate, since many combined reactions and pseudo reactions were lost on account of late examinations and they were therefore not recorded. It is interesting to note that only reactors who showed a combined reaction suffered local swelling with pain and some slight constitutional disturbance, such as malaise and slight headache. Children who did not give a combined reaction but showed local reaction probably were pseudo reactors which were lost, leaving positive reaction.

There were 289 negative reactors of which 163 were boys and 126 girls. We undoubtedly had many pseudo reactions among negative reactors,

but these have been lost because our cases were not followed up daily after testing or because many children were absent from school after they were tested. Here again, we were handicapped by an insufficient working force. Children should be followed daily if accurate results are desired. In so far as the results of our work are concerned, the line of division is between the positive and negative reactors and these we have been able to read with accuracy.

The following chart represents the number of children tested according to grade, age and reaction:

Grades	Number Tested	Boys	Girls	Positive		Negative		Pseudo		Combined		Ages
				Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	
Kindergarten	49	33	16	27	9	4	5	0	0	0	0	3–5
Grade 1.....	214	112	102	61	71	22	25	0	1	0	0	4–10
Grade 2.....	110	58	52	33	34	22	11	0	2	0	0	5–14
Grade 3.....	107	51	56	36	36	14	13	0	0	0	2	6–11
Grade 4.....	135	64	71	34	53	25	17	0	1	0	2	7–15
Grade 5.....	131	67	64	24	51	26	19	0	2	0	3	7–13
Grade 6.....	95	54	41	33	21	14	13	1	0	1	2	9–15
Grade 8.....	92	44	48	11	13	24	16	1	2	8	3	11–16
Grade 9.....	46	23	23	7	12	12	7	3	3	0	0	13–16
	979	506	473	266	300	163	126	5	11	9	12	

A striking feature visibly prominent in the behavior of the children towards this work was their attitude of willingness to be tested and inoculated; in fact, there was considerable rivalry among the youngsters for leadership in courage and complacency while the needle was being used.

A survey of the cases of diphtheria reported among school children attending the schools of the two districts reveals the interesting fact that only non-tested and therefore non-immunized children were affected; and of those tested, only positive reactors in whom immunity had not been established were taken ill with Diphtheria.

Dr. Zingher of New York, and in fact all workers and investigators in this field of preventive work, unanimously agree that active immunity develops in from four to eight months after treatment with toxin-antitoxin. Some children do not develop immunity regardless of the number of injections administered, but these are in a very small number; others require several injections before immunity is finally established. However, it is very important to determine if a child is immune before he is so certified. This is done by re-Schick-Testing the inoculated children in from six to eight months after a series of injections have been administered. If a child is found to be susceptible, as determined by positive Schick reactions, it is necessary to subject him to a second series of inoculation and re-testing. This requires, of course, considerable supervision, which will demand a sufficient corps of workers in the field. We have not had the

opportunity to determine the number of children who have been rendered immune by active immunization with toxin-antitoxin as revealed by the Schick Test. This will be done when the schools open next September. If active immunization is instituted in the beginning of a school year, re-tests can be made before the school year is ended. Our work began late in the school year. It is also important to follow up immunized children and negative reactors to determine if these children develop diphtheria. One of our difficulties will be with cases of tonsilitis, who are carriers and who give a positive culture, but who are negative to the Schick Test. This is an educational problem which will have to be dealt with by other agencies. Such cases have occurred in our series.

In the New York Schools, from 70–93% of children were rendered immune after two series of toxin-antitoxin injections. It will be interesting to determine when the schools reopen next September how many of our children have been rendered immune after one series of injections.

The shocking mortality and morbidity from diphtheria, despite our advanced knowledge of the disease and with the aid of antitoxin raises the question of prophylaxis which has its answer in this new method of active immunization with toxin-antitoxin. Whether children should be tested before they are actively immunized is a question to be answered for the child of pre-school age. But in the public schools, I firmly believe that all children should be tested first more as a matter of policy than of necessity. At any rate, whether tested or not, all susceptible children should be immunized if this dreaded preventible disease is to be eradicated. Since the Boston Health Department is actively engaged in the active immunization of the pre-school child, it should be the duty of the school physician to pursue this work in the schools.

I earnestly plead for the organization of a corps of physicians and nurses whose only duty shall be the carrying on of diphtheria-prevention work in the Boston Public Schools. Boston should not be a late entrant into this field of preventive work. Boston should take its place with the other progressive cities where this work is being actively carried on, with the view of saving from untimely death and from unnecessary illness, which often permanently incapacitates, many thousands of our children.

It is with this thought in mind that I ask permission to carry on this work on a broader and larger scale throughout the entire school system when the schools reopen next September.

I take this opportunity of expressing my profound appreciation of the encouragement and co-operation and courtesy afforded me by Dr. William H. Devine, the Director of Medical Inspection, Boston Public Schools, and by Dr. Benjamin White of the Antitoxin Laboratory, who is an earnest and enthusiastic worker in this field of preventive medicine and who supervises the preparation of the toxin and toxin-antitoxin used in this work. I desire to express many thanks to Dr. Edwin H. Place of the Boston City Hospital, whose enthusiasm inspired this work and whose experience with this method of diphtheria prevention has helped me in this work.

I beg leave to record here also my appreciation of the school nurse, Miss Theresa V. Kelly, whose untiring devotion to this work made it

possible for me to carry it on to its present conclusion. Miss Mary E. Keyes and Mr. Herbert L. Morse, Masters of the William Lloyd Garrison and George Putnam Districts respectively, have shown a spirit of co-operation which resulted in creating greater confidence of parents in this work; and the school teachers are deserving of a very large share of credit for their activity in educating the children in the harmlessness and usefulness of the Schick Test, and of toxin-antitoxin injections."

The Director of Medical Inspection desires to express his appreciation of Dr. Rubin's ability and zeal in conducting the Schick Test and administering of toxin-antitoxin.

Respectfully submitted,

WILLIAM H. DEVINE,

Director of Medical Inspection.

SCHOOL DOCUMENT NO. 13—1922

BOSTON PUBLIC SCHOOLS

GENERAL SCIENCE FOR INTERMEDIATE SCHOOLS

PAMPHLET No. 3—ASTRONOMY

BOSTON
PRINTING DEPARTMENT
1922

In School Committee, Boston, November 6, 1922.

Ordered, That the two accompanying pamphlets of a series of courses in science for intermediate schools and classes,

No. 3. Astronomy,
No. 14. Yeasts, Molds and Bacteria,

are hereby authorized to be printed as school documents.

THORNTON D. APOLLONIO,
Secretary.

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GENERAL SCIENCE FOR INTERMEDIATE CLASSES.*

This outline of work has been prepared by a council, comprising teachers in the high, intermediate and elementary schools of the city, under the supervision of Mr. Arthur L. Gould, Assistant Superintendent. The members of the council are as follows:

Joseph R. Lunt, *Chairman*,	English High School.
George W. Gammon, *Secretary*,	John Marshall School.

Representing the high schools:

Charles H. Stone, Jr.	English High School.
Ralph C. Bean	Girls' High School.
Francis E. Mason	High School of Commerce.
Adelbert H. Morrison	Mechanic Arts High School.
Dennis C. Haley	Roxbury High School.
Lillian J. MacRae	South Boston High School.
Thomas P. Dooley	West Roxbury High School.

Representing the intermediate schools:

Gertrude V. Nugent	Emerson School.
Joel W. Reynolds	George Putnam School.
Etta A. Manning	John Winthrop School.
Mary M. Byrne	Lewis School.
Melzar H. Jackson	Mary Hemenway School.
Catherine T. Hunt	Robert G. Shaw School.
Esther E. Larson	Ulysses S. Grant School.

Representing the elementary schools:

Mabel A. Woodward	Christopher Gibson School.
S. Albert Cragin	Dearborn School.
Charles H. Early	Henry Grew School.
Frederic H. Buck	Mather School.
Frances M. Murphy	Phillips Brooks School.
William R. Kramer	Prescott School.
Bertha C. Quinnam	Roger Wolcott School.
Sidney T. H. Northcott	William E. Russell School.

* This pamphlet was prepared by Etta A. Manning, John Winthrop School, and Esther E. Larson, Ulysses S. Grant School.

PREFACE.

Thomas Carlyle expressed the silent reproaches of probably many inquiring minds that do not possess even a superficial knowledge of the heavens when he complained, "Why did not somebody teach me the constellations and make me at home in the starry heavens which are always overhead and which I don't half know to this day?"

There are many reasons why a simple study of astronomy should be included in a general science course. It is a delight to the child to trace the constellations, as he listens to the fascinating stories linked with them, and with little difficulty he soon becomes acquainted with the people and the animals in the "oldest picture book of man." The stories of Jupiter with its many moons and mysterious red spot, of Saturn with its rings, and of Mars with its snowcaps and strange markings, arouse the interest and astonishment of the child. He is inspired with sentiments of awe and reverence, as he learns of the order and harmony which prevail among the heavenly bodies comprising the universe, and unconsciously unites in the praise of his Creator.

What though, in solemn silence, all
Move round this dark, terrestrial ball?
What though nor real voice nor sound
Amidst their radiant orbs be found?
In Reason's ear they all rejoice,
And utter forth a glorious voice,
Forever singing as they shine:
"The hand that made us is divine!"

The following outline represents a series of lessons taught to a class of eighth and ninth grade pupils. After a study of constellation diagrams similar to those included in the outline, the pupils were taken into the field for observation.

Contemplated as one grand whole, astronomy is the most beautiful monument of the human mind, the noblest record of its intelligence.—*La Place.*

PART I.—THE CONSTELLATIONS.

PROJECT I. TO DISCOVER THE CHARACTERISTICS OF STARS.

By observation three conclusions are reached:

1. Stars are apparently fixed.
2. Stars vary in color.
3. Stars vary in brightness.

While the stars are considered fixed, they really move very rapidly through space, but they are so far away that they appear to be at rest.

The stars visible to the naked eye are divided, according to their brightness, into six magnitudes. Examples: First magnitude, Vega, Sirius; fourth magnitude, Alcor. The sixth magnitude stars are difficult to see.

The color of a star is probably due to its temperature, to its composition, and to the atmosphere surrounding it.

White.	Red.	Yellow.	Orange.	Bluish.
Pole.	Betelgeuse.	Capella.	Arcturus.	Vega.
Procyon.	Aldebaran.			Sirius.
Rigel.	Antares.			

PROJECT II. TO IDENTIFY THE CIRCUMPOLAR CONSTELLATIONS.

These constellations are located in the northern part of the sky and are visible any clear evening.

NOTE.— The Barritt "Service, Star and Planet Finder," and the "Monthly Evening Sky Map," published by Leon Barritt, Brooklyn, N. Y., will assist the teacher in locating the constellations and planets.

PROBLEM 1. TO LOCATE URSA MAJOR — THE GREAT BEAR (THE GREAT DIPPER).

The seven stars which form the Dipper are a small part of the whole Bear constellation. The handle of the Dipper is the tail of the Bear. Alpha and Beta are

The Great Dipper in Ursa Major.

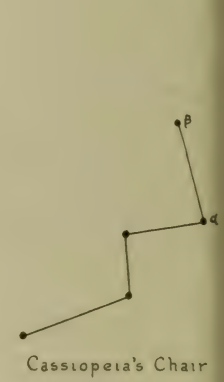
called pointers because they point to Polaris, the Pole or North Star. The star in the bend of the handle is quadruple and is known as Mizar. Above Mizar is Alcor. To the Indians these stars were known as "the old squaw and the papoose on her back."

The Myth.— Juno was jealous of Callisto and changed her into a bear. Callisto's son, Arcas, became a great hunter and not recognizing his mother as a bear, was about to kill her when Jupiter interfered and placed both of them in the heavens as the Great and Little Bears.

PROBLEM 2. TO LOCATE URSA MINOR — THE LESSER BEAR (THE LITTLE DIPPER).

Ursa Minor is an important constellation because it includes Polaris, the North Star, which is at the end of the tail of Ursa Minor, and, like Mizar, is quadruple. The axis of the earth slowly changes its direction. In twelve thousand years Vega will be the Pole Star. The guardians of the Pole are two bright stars that correspond to the pointers in the Great Dipper.

The Little Dipper in Ursa Minor.



Cassiopeia.

PROBLEM 3. TO LOCATE CASSIOPEIA — THE QUEEN IN HER CHAIR.

The five brightest stars in this constellation form an irregular W which opens towards the North Star.

The Myth.— Cepheus and Cassiopeia were the king and queen of Ethiopia. Andromeda was their beautiful daughter. Cassiopeia boasted that Andromeda was more beautiful than the sea nymphs, and as punishment Neptune sent a sea monster to destroy the shores of Ethiopia. To appease the gods, Andromeda was bound to a rock to be devoured by Cetus. Perseus, with the aid of his winged horse, Pegasus, came flying through the air and with the head of Medusa turned his opponents into stone and rescued Andromeda.

PROBLEM 4. TO LOCATE DRACO — THE DRAGON.

Draco is the long serpent that stretches itself between the Great and Little Dippers. Four stars form a trapezium and mark the head of the dragon.

Draco.

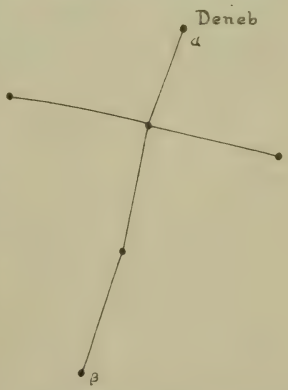
The Myth.— According to some of the poets, Draco was the guardian of the golden apples of the Hesperides. According to others the dragon was the monster that was killed by Cadmus in Bœotia.

PROJECT III. TO IDENTIFY SIX CONSTELLATIONS THAT ARE VISIBLE DURING SEPTEMBER, OCTOBER AND NOVEMBER.

These constellations include Cygnus, Lyra, Aquila, Pegasus, Andromeda and Perseus.

PROBLEM 1. TO LOCATE CYGNUS — THE SWAN —THE NORTHERN CROSS.

Six stars in the Milky Way form a large cross which is known as the Northern Cross. Deneb, a first magnitude star, is located at the upper end of the cross. This figure is only a part of the larger constellation, the Swan. To the east of Deneb is 61 Cygni, the first star whose distance was measured from the earth. It requires only seven and one-fifth years for the light of this sun to reach our planet.



The Swan — the Northern Cross.

The Myth.— Phaethon was the son of Apollo. He received per-

mission from his father to drive the sun chariot through the heavens for one day. The horses became unruly and rushed out of their path. The earth was saved from fire by Jupiter, who killed Phaethon with a thunderbolt. Cygnus was grieving beside a river over the unhappy fate of his kinsman, Phaethon, when Apollo changed him into a swan.

PROBLEM 2. TO LOCATE LYRA — THE HARP.

The constellation includes Vega, one of the most attractive stars in the heavens. Vega is bluish white and is a first magnitude star. This large sun marks the place toward which our solar system is traveling at the rate of twelve miles per second.

Lyra.

The Myth.— Lyra is the harp that was given to Orpheus by Apollo. Very remarkable things were accomplished with this instrument by means of which beasts were tamed and rocks and trees were moved and rivers ceased to flow.

PROBLEM 3. TO LOCATE AQUILA — THE EAGLE.

Three important stars mark this constellation. The middle star, Altair, is a first magnitude star. The light

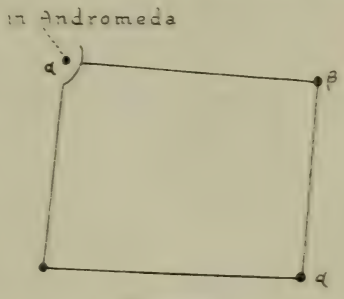
Aquila.

from this sun reaches the earth in about fifteen years, while the sun itself is traveling toward us at the rate of twenty-seven miles a second.

The Myth.— Aquila was the eagle which Jupiter kept seated by his throne.

Problem 4. To Locate Pegasus — the Winged Horse.

Four second magnitude stars form the corners of the large square of Pegasus. Three of these stars are included in the constellation Pegasus. The fourth belongs to Andromeda.

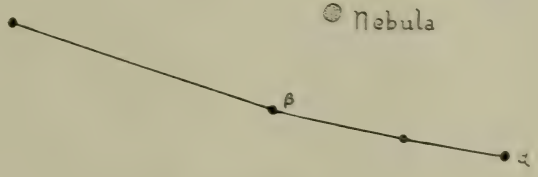


Pegasus.

The Myth.— Pegasus, the winged horse, sprang from the blood of Medusa. It was he who carried the thunder and lightning for Jupiter. Pegasus was tamed by Minerva and aided Bellerophon in the destruction of the Chimera, a fire-breathing monster with the head of a lion, the body of a goat and the tail of a dragon.

Problem 5. To Locate Andromeda.

Three second magnitude stars mark this constellation. Above the second star is the nebula in Andromeda.

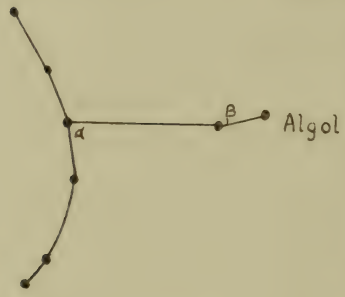


Andromeda.

It resembles a hazy star. Near Andromeda are her father, Cepheus; her mother, Cassiopeia; and Pegasus and Perseus, who saved her from a horrible death.

Problem 6. To Locate Perseus.

This constellation may be identified by a curved line of stars near Cassiopeia. The most interesting star in this group is Algol. It is called a variable star because it shines very brightly for a few days, then loses some of its light and becomes a star of the third magnitude. In a short time it regains its original brilliancy and is a second magnitude star. It is not surprising that such names as the "demon star" and "slow-winking star" have been frequently applied to Algol. The variation in brightness is no doubt due to eclipses caused by a dark satellite.



Perseus.

The Myth.— Perseus was sent to capture the head of Medusa. Medusa was a horrible monster having snakes for hair, claws, and large gold-colored wings. She had the power of changing to stone all on whom she looked. The gods aided Perseus in his venture and he succeeded in killing the Gorgon. The head was finally given to Minerva. She wore it on her shield.

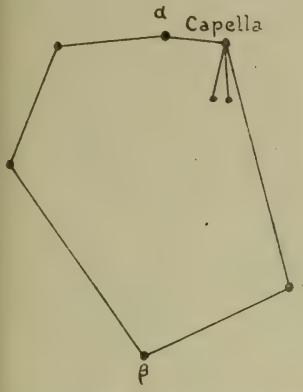
PROJECT IV. TO IDENTIFY FOUR CONSTELLATIONS THAT ARE VISIBLE DURING DECEMBER, JANUARY, FEBRUARY AND MARCH, AND TWO THAT MAY BE OBSERVED DURING JANUARY, FEBRUARY, MARCH AND APRIL.

These constellations include Auriga, Taurus, Orion, Gemini, Canis Major and Canis Minor.

Problem 1. To Locate Auriga — the Charioteer.

Auriga represents a man holding a goat in his arms. Capella, a double, bright yellow, first magnitude star,

is located in the body of the goat. It is nearer to the North Star than any of the brightest stars. The three faint stars represent the kids.



Auriga — the Charioteer.

Taurus — the Bull.

PROBLEM 2. TO LOCATE TAURUS — THE BULL.

Taurus includes two clusters of stars, the Hyades, which form a figure like the letter V, and the Pleiades, often incorrectly called the Little Dipper. The V forms the face of an angry bull lowering his head to toss Orion. Aldebaran, a bright red, first magnitude star at one end of the V, is known as the bull's eye. Its light reaches the earth in thirty-two years. The Pleiades, or Seven Sisters, form the shoulder of the bull. Six of the group are plainly seen, but the number is increased to thousands by the telescope.

The Myth.— Europa was the daughter of Agenor, king of Phœnicia. She was loved by Jupiter. In order to win her he changed himself into a bull. One day, as Europa was gathering flowers, she met the bull. She mounted his back and was soon carried away from Phœnicia to Crete.

The Pleiades were the daughters of Atlas. One of the sisters married a mortal and lost her brightness, so only six stars are visible.

PROBLEM 3. TO LOCATE ORION — THE HUNTER.

The giant Hunter carries a hunter's club, a sword, a girdle and a lion's skin. Two first magnitude and four second magnitude stars are included in this constellation. Orion is the brightest and most brilliant of all constellations. Betelgeuse is a red, first magnitude star. It is located in the right shoulder of the giant. It is many thousand times larger than our sun and it is the first star to have its diameter measured. Rigel is a white, first magnitude star and is located in the left foot of the figure. Bellatrix marks the left shoulder and Saiph marks the right leg. Three second magnitude stars form the belt. The nebula in Orion surrounds the middle star in the belt. No doubt in this great workshop, as in the nebula of Andromeda, many suns are in the process of formation.

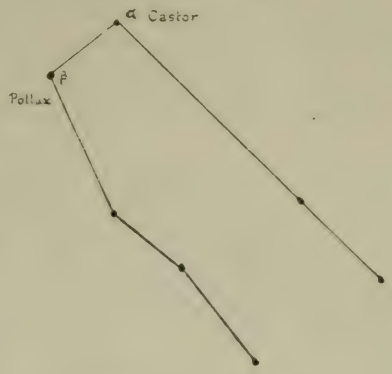
Orion.

The Myth.— Orion was a giant hunter. The king of Chios deprived him of his eyesight in punishment for his cruelty. At the suggestion of the oracle, Orion turned his eyeballs to the rising sun and recovered his sight. Later he went to Crete and lived as a hunter with Diana. The sting of the scorpion caused his death.

PROBLEM 4. TO LOCATE GEMINI — THE TWINS.

Castor and Pollux are the important stars in Gemini. They are so much alike in size and brilliancy that the Twins is an appropriate name for the constellation. The ancients believed that Castor and Pollux had a

favorable influence over navigation. Neptune rewarded their brotherly love and gave them power over the waves and winds, and for this reason they were worshipped as protectors of the sailors.



Gemini — the Twins.

The Myth.— Castor and Pollux were twin brothers, children of Leda and Jupiter. The brothers performed several feats. They took part in the expedition to Attica to rescue their sister Helen from Theseus. While engaged in combat, Castor was killed and Pollux, who was immortal, implored Jupiter that he, too, might die in order to be with his brother. Jupiter took pity on Pollux and rewarded the attachment of the brothers by placing them among the stars as Gemini.

Problem 5. To Locate Canis Major — the Big Dog.

(Visible during January, February, March, April.)

An important constellation because it includes Sirius, the brightest star in the heavens. Sirius, called also

Canis Major.

the Dog Star, is in the mouth of the dog and is a pure white star, and its magnitude is 1.4. It requires more

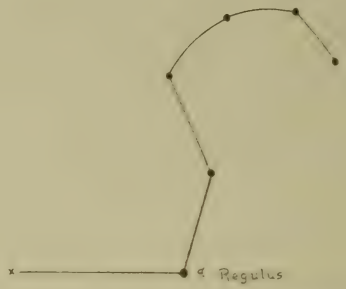
than eight years for its light to reach the earth, although it is one of the nearest stars. Canis Major and Canis Minor are Orion's dogs. They follow him as he chases the Bull across the sky.

Problem 6. To Locate Canis Minor — the Little Dog.

(Visible during January, February, March, April, May.)

Canis Minor includes Procyon, a first magnitude star. Sirius, Betelgeuse and Procyon form a triangle. Procyon means "before the dog." It is an appropriate name for this star as it rises fifteen to twenty minutes before Sirius, the Dog Star. Procyon, like Sirius, is one of our nearest neighbors. Its light reaches us in twelve years.

Canis Minor.



Leo — the Lion.

PROJECT V. TO IDENTIFY THREE CONSTELLATIONS THAT ARE VISIBLE DURING APRIL, MAY AND JUNE.

These constellations include Leo, Virgo and Boötes. Scorpio may be learned in June.

Problem 1. To Locate Leo — the Lion.

Two groups of stars are conspicuous in this constellation. Four stars form an irregular quadrilateral. Six others make a sickle. Regulus is a first magnitude star at the end of the sickle. This star is much larger than

our sun and is very far away, as it takes more than seventy years for its light to reach the earth.

The Myth.— According to some of the poets, this was an enormous lion that lived in the woods of Nemea. By strangling the lion, Hercules accomplished the first of his twelve labors.

PROBLEM 2. TO LOCATE VIRGO — THE VIRGIN.

Spica is the important star in this constellation. It is so far away that it has been impossible to measure its distance from the earth. The constellation includes thirty-eight or forty visible stars.

Virgo is the goddess of Justice. In one hand she holds the scales of Justice. In the other hand she bears a sheaf of wheat. Spica is in the sheaf of wheat.

Virgo.— The Virgin.

Boötes.

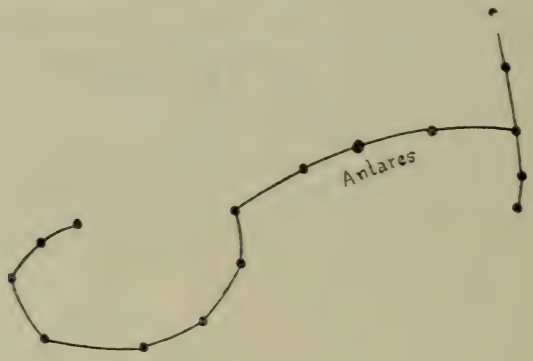
PROBLEM 3. TO LOCATE BOÖTES — THE BEAR DRIVER.

This constellation may be identified by a kite-shaped figure not far from the handle of the Great Dipper. It includes a very bright star known as Arcturus. This first magnitude star marks the knee of the hunter. It takes one hundred sixty years for the light of Arcturus to reach the earth.

The Myth.— Boötes was the son of Callisto. He represents a hunter holding a club in his hand and the leash of his two greyhounds in his left hand.

Problem 4. To Locate Scorpio.

Scorpio may be seen low in the southeast in June. This constellation includes Antares, a bright red, first



Scorpio.

magnitude star. The name Antares means the rival of Mars, and it is an appropriate name for this attractive sun. Several third and fourth magnitude stars are also included in Scorpio.

Note.— In many of the diagrams, only the stars which mark the constellations are shown.

PART II.—THE SOLAR SYSTEM.

PROJECT I. TO STUDY THE MOTIONS OF THE EARTH.

Problem 1. How the Earth Turns on its Axis.

Light a candle and set it on a small stand. Let this represent the sun. Stick a darning needle through the center of an orange. Let the orange represent the earth. Hold the darning needle in a vertical position and slowly rotate the orange. What portion of the orange is lighted by the candle? What portion is in darkness? Explain from this the cause of day and night. Does the sun actually rise and set? Why is it dark at night?

Problem 2. How the Earth Moves Around the Sun.

a. With the orange and candle show how the earth revolves around the sun. How long a journey is this? How fast does the earth travel? How long does it take for this journey? How long would it take an express train, traveling at the same rate, to complete the journey? Is the earth always at the same distance from the sun?

b. Let a member of the class represent the earth, and walk around the burning candle, pivoting at the same time, to illustrate the two motions of the earth.

PROJECT II. OUR NEAREST STAR, THE SUN.

Problem 1. To Locate Where the Sun Seems to Rise and Set.

Have each pupil locate the exact position of the rising and setting sun on September 23; on December 21; on March 23; on June 21. The exact positions of the sun may be noted by trees, chimneys, buildings, etc.

What is the apparent motion of the sun from September 23 to December 21? From December 21 to March 23? From March 23 to June 21?

PROBLEM 2. TO STUDY THE APPARENT PATH OF THE SUN THROUGH THE SKY.

a. On September 23 let each pupil observe carefully the apparent path of the sun through the sky, from sunrise to sunset. Note the elevation of the sun above the horizon at twelve o'clock noon. Mark this elevation carefully by sighting past some tree or building. Repeat these observations on December 21; on March 23; on June 21. Compare the elevations of the sun above the horizon on these four dates. Is the sun higher on September 23, or on December 21? On December 21, or on March 23? On March 23, or on June 21? Notice the apparent distance the sun travels during the day on September 23; on each of the other dates given. Compare these apparent distances. Why are the days shorter on December 21 than on September 23? Why are the days longer on March 23 than on December 21? Why do the days increase in length from March 23 to June 21?

b. Light the candle and set it on the table, to represent the sun. For the earth, take a croquet ball, painted black. Drive a long, slender nail in the top of the ball. Drive another nail directly opposite the first one. With chalk, mark off lines to represent the equator, Tropic of Cancer, Tropic of Capricorn, the Arctic Circle, and the Antarctic Circle. Hold the ball by the two nails, tipping the top about twenty-three and one half degrees toward the candle flame. Without changing the position of the ball, rotate it slowly, moving it around the candle at the same time. Note the positions for the summer solstice, autumnal equinox, winter solstice, and the vernal equinox. When is the north pole tipped away from the sun? Toward the sun? Account for the changes in day and night. For the different seasons.

PROJECT III. A STUDY OF THE MOON.

The moon is the earth's satellite, and her nearest neighbor. It is a dead world, without air or water. It receives its light from the sun. This light is sent from the moon to the earth by reflection. The moon is covered with high mountains, extinct volcanoes and deserts.

The moon turns once on its axis in its revolution around the earth, and so it always presents the same face to the earth. It revolves around the earth in twenty-seven and one-quarter days, and with the earth revolves around the sun. As the moon moves along in its orbit, the side of the moon turned toward the earth receives more and more light from the sun, and the face changes from new moon to crescent, first quarter, gibbous and full moon. Gradually it loses its light and more and more of its disc is in shadow. It changes back to gibbous, last quarter and waning crescent.

Problem 1. How the Moon Looks at Night.

Look at the moon on a clear night. Where does the light come from? How is this light sent to the earth? Notice the dark and bright spots on the surface of the moon. What are these spots? Is part of the moon in shadow? Draw a picture of the moon as it appears to you.

Problem 2. How the Moon Changes.

Watch the changes of the moon for one month. If possible, consult a Farmer's Almanac. Where does the first crescent of the new moon appear? The full moon? The waning crescent?

Problem 3. How the Moon Moves.

a. Using a candle, marble and orange, show how the moon moves. Let the candle represent the sun, the marble represent the moon, and the orange represent the earth.

b. Light the candle and set it on a table, to represent the sun. Let one member of the class represent the earth and another member the moon. Let them move around the burning candle to illustrate the different motions of the earth and the moon. This exercise will give the class an excellent idea of these motions.

PROJECT IV. A STUDY OF THE PLANETS.

NOTE.— Consult the "Monthly Evening Sky Map," published by Leon Barritt, Brooklyn, N. Y., for information concerning time of appearance and location of planets.

PROBLEM 1. TO IDENTIFY MERCURY.

Mercury is the nearest planet to the sun. It is always near to the horizon and is difficult to see because it is so near the sun. It is brilliant white and is smaller than the earth. Mercury was the god of thieves and the swiftest messenger of the gods. The planet travels around the sun in the shortest time — eighty-eight days — and because of its nearness to the sun steals more light and heat than any other planet.

PROBLEM 2. TO IDENTIFY VENUS.

Venus revolves around the sun in 225 days. It has phases like the moon. The planet is covered with clouds and it is difficult to learn much about the real surface. The size of Venus almost equals that of our earth. In early times two names were applied to this planet, Phosphorus for the morning star, and Vesper when it appeared in the evening.

PROBLEM 3. TO IDENTIFY MARS.

Mars was named for the god of war. Its fiery red color may be due to a red vegetation or to the presence of a red rock on its surface similar to our red sandstone. Mars has two moons, Phobus (Fear) and Deimos (Fright), named for the two horses that drew the chariot of the god of war. This planet revolves around the

sun in 687 days. Mars is very mature. Located at the poles are snow caps which increase and decrease in size during the winter and summer seasons. According to Professor Lowell, Mars may be inhabited by ingenious and intelligent giants. These people have built wonderful canals to carry water to all parts of the planet from the melting snow caps. The canals cannot be seen, but the luxuriant growth of vegetation along their banks determine the location of these great waterways.

Problem 4. To Identify Jupiter.

Jupiter was named for the king of the gods. It is the giant planet. The true surface changes so rapidly that it is difficult to make a map of Jupiter. The surface is also hidden by clouds so thick that no telescope has been able to pierce them. Jupiter has hardly cooled. The red spot on Jupiter has long been observed by astronomers. Two explanations are noted: (1) It may be a projection from a partially solid interior. (2) Because of its movement towards the edge of the disc of the planet, it has been suggested that this part of the planet is soon to be thrown off and will become one of Jupiter's moons. Jupiter now has nine moons.

Problem 5. To Identify Saturn.

This planet revolves around the sun in twenty-nine and one-half years. It has ten moons. Saturn may be so hot that it is composed of vapors. The rings are the attractive and strange feature of the planet Saturn. We are not surprised that it is called the weird member of the solar system. These rings may be composed of gases which have become solid by cooling and contracting. Separate bodies have been formed and revolve around the planet. (See nebular theory.) Three rings are prominent; the inner is hazy and is known as the crape ring; two outer rings are separated by a dark line which represents a great distance between the rings.

Note.— While Uranus and Neptune are not visible

without a telescope, a few statements may be added concerning the distant members of the sun's family.

Uranus revolves around the sun in eighty-four years. It has four moons and was discovered by Herschel in 1781.

Neptune was named for the god of the sea. It has one moon and revolves around the sun in 165 years. It was the last planet to be discovered. Its attraction for Uranus and the effect of this attraction on the planet resulted in the discovery of Neptune. By the mathematical calculations of Leverrier, a French astronomer, and of Adams, an English astronomer, the exact location of the planet was discovered.

SPECIAL APPARATUS.

Planisphere. Whittaker. Hammett & Co.
Monthly Evening Sky Map. Leon Barritt. Brooklyn, N. Y.
Star Craft (6 charts). Hammett & Co.

REFERENCE BOOKS.

The Story of the Stars. Chambers. D. Appleton & Co.
Friendly Stars. Martin. Harper Brothers.
How to Identify the Stars. Milham. The MacMillan Company.
Trees, Stars and Buds. Moseley. World Book Company.
A Field Book of Stars. Olcott. G. P. Putnam's Sons.
Star Lore of all Ages. Olcott. G. P. Putnam's Sons.
New Astronomy. Todd. American Book Company.
Lessons in Astronomy. Young. Ginn & Co.

(1,000-11-6-'22.)

SCHOOL DOCUMENT NO. 14—1922

BOSTON PUBLIC SCHOOLS

GENERAL SCIENCE FOR INTERMEDIATE CLASSES

PAMPHLET No. 14—YEASTS, MOLDS, AND BACTERIA

BOSTON
PRINTING DEPARTMENT
1922

In School Committee, Boston, November 6, 1922.

Ordered, That the two accompanying pamphlets of a series of courses in science for intermediate schools and classes,

No. 3. Astronomy,
No. 14. Yeasts, Molds, and Bacteria,

are hereby authorized to be printed as school documents.

Attest:

THORNTON D. APOLLONIO,
Secretary.

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GENERAL SCIENCE FOR INTERMEDIATE CLASSES.*

This outline of work has been prepared by a council, comprising teachers in the high, intermediate and elementary schools of the city, under the supervision of Mr. Arthur L. Gould, Assistant Superintendent. The members of the council are as follows:

Joseph R. Lunt, *Chairman.*	English High School.
George W. Gammon, *Secretary,*	John Marshall School.

Representing the high schools:

Charles H. Stone, Jr. . .	English High School.
Ralph C. Bean	Girls' High School.
Francis E. Mason . . .	High School of Commerce.
Adelbert H. Morrison . .	Mechanic Arts High School.
Dennis C. Haley	Roxbury High School.
Lillian J. MacRae . . .	South Boston High School.
Thomas P. Dooley . . .	West Roxbury High School.

Representing the intermediate schools:

Gertrude V. Nugent . .	Emerson School
Joel W. Reynolds . . .	George Putnam School.
Etta A. Manning . . .	John Winthrop School.
Mary M. Byrne	Lewis School.
Melzar H. Jackson . . .	Mary Hemenway School.
Catherine T. Hunt . . .	Robert G. Shaw School.
Esther M. Larson . . .	Ulysses S. Grant School.

Representing the elementary schools:

Mabel A. Woodward . .	Christopher Gibson School.
S. Albert Cragin . . .	Dearborn School.
Charles H. Earley . . .	Henry Grew School.
Frederic H. Buck . . .	Mather School.
Frances M. Murphy . .	Phillips Brooks School.
William R. Kramer . . .	Prescott School.
Bertha C. Quinnam . . .	Roger Wolcott School.
Sidney T. H. Northcott .	William E. Russell School.

* This pamphlet was prepared by Lillian J. MacRae, South Boston High School; Gertrude V. Nugent, Emerson School.

PREFACE.

In preparing the pamphlet on *Bacteria, Molds and Yeast* particular attention has been given to such common facts as the pupils in the intermediate grades need for an intelligent understanding of the experiences in their daily lives.

Only such experiments as require simple and available material have been selected. Enough questions have been introduced to arouse in the minds of both teachers and pupils others along the same lines. The conclusions furnish the essential facts, but should be supplemented by the teachers' wider knowledge.

The work has been planned for classes not furnished with microscopes and magnifiers. This has been purposely done to show that the really valuable work is not dependent upon the microscope.

PROJECT I. A STUDY OF YEAST.

Problem 1. What Does Yeast Do?

Home Experiment.

At home, dissolve one half yeast cake in a little water in a tumbler. Add two teaspoonfuls of molasses. Fill the tumbler full of tepid water and cover with a glass or cardboard. Invert and carefully lower into a dish containing water about an inch deep. Put in a warm place. What happens in one hour? In two?

Class Experiment.

(*a*) Have a group of pupils arrange three one-quart jars at school. In each of two jars put one yeast cake and one tablespoonful of molasses. Mix thoroughly in a little water. Then fill with tepid water. Invert the jars in a dish of water and put in a warm place. Compare with results of the home experiment.

In the third jar put molasses and water only. Invert like the others. It is the control. Why do we have a control? How does it help in thinking about the experiment?

(*b*) What is the gas in the jar?

Test the gas in one jar with a blazing splint? Test the gas in the other jar with lime water. This can be most easily done by pouring a little lime water into a tumbler, and then pouring the carbon dioxide over it. Quickly place a glass plate over the tumbler and shake. What happens? What is the gas?

Problem 2. How Large Are Yeast Plants?

Dissolve one sixteenth of a yeast cake in a glass of water. What do you see? Filter. What color is the water? Where are the little yeast plants? How large are they? Look on the filter paper. The little

yeast plants are so tiny that when suspended in water they cannot be seen, but they are large enough to be caught by the filter paper.

Problem 3. At What Temperature Does Yeast Grow Fastest?

(*a*) Take three flasks fitted with one-hole rubber stoppers. Into each flask put one half yeast cake and a tablespoonful of molasses mixed thoroughly in water. Fill with tepid water and put in a warm place for one to two hours before the lesson. At the beginning of the lesson insert a small glass funnel in the stopper and press the stopper into the mouth of the flask. Fill the funnel half full of water. Then fill a test tube with water. Place the thumb firmly over the opening. Lower the test tube into the funnel. The test tube is to be kept erect with the opening directly over the funnel tube. This can be done easily, by slipping a cardboard, with a hole in the center, over the test tube, and pressing it down until it rests on the funnel.

Stand one flask in ice cold water, one in water at 75 to 80 degrees Fahrenheit and the other in boiling water. Note results. Which test tube fills with gas quickest? What gas is given off when yeast grows? We may judge of the rapidity of growth of yeast by the rapidity of the forming of carbon dioxide. At what temperature is CO_2 formed fastest? Therefore at what temperature does yeast grow fastest?

(*b*) Mix one half cup of flour and one half yeast cake with tepid water to a firm ball. Place in a glass jar. Make two others like this. Place one jar in ice cold water, one in warm water and one in hot water. Note results. Explain why this happened. At what temperature should bread be put to rise? Why should it not be chilled?

Conclusions.

A yeast cake is a mass of little yeast plants mixed with a food substance. A yeast plant is a tiny oval or rounded body called a cell which multiplies by budding.

There are many wild yeasts distributed in the dust of the air. Nearly all fruits have yeasts on the surface, and it is these yeasts that start decay when the skin is broken.

Certain kinds of yeasts are cultivated. They grow best at a temperature of 70 to 80 degrees. Growth is checked by cold, and the plants are killed by boiling. Yeast is important because of its power of fermentation. During fermentation sugar is broken up into carbon dioxide and alcohol. It is the carbon dioxide gas bubbles that cause bread to rise. The alcohol is evaporated during the baking of the bread.

PROJECT II. A STUDY OF MOLDS AND MILDEWS.

Problem 1. Where Are Molds and Mildews Found?

Home Experiment.

Hunt for substances that have molded. Bring examples to school. Sprinkle one half slice of bread with water and put into a glass jar having a tight-fitting cover. Bring to school. Allow five days to elapse before the lesson.

Problem 2. Can Molds and Mildews Be Planted?

Class Experiment.

Let a group of pupils, five days before the lesson, cut slices of bread. Place each slice in a glass bowl, sprinkle it with water, and plant with mold and mildew spores. Try to get each slice well planted with one type of spore. Cover tightly. Keep in a warm, dark place.

Problem 3. To Make a Sketch of a Mold Plant.

Examine bread mold. Notice the threads against the glass. The mass of white threads is the mycelium. This is the plant body. Notice the little white balls (unripe sporangia), the black balls (ripe sporangia).

These sporangia are borne at the top of special branches ascending from the mycelium. Look at the point where these branches arise. Note the root-like cluster of threads. Such branches enter the bread and absorb the food. Draw one cluster of sporangia and show how they are attached to the mycelium.

Problem 4. Under What Conditions Do Molds Grow?

Let the pupils examine their own specimens. Find bread mold. Let a group of pupils plant spores of each kind on fresh bread. How long does it take to get cultures that are planted? Plant some in dishes that are covered and some that are uncovered. Plant some on moist bread and some on dry bread.

Does mold develop on dry bread? Does mold develop when bread is exposed to the air? Plant mold spores on moist bread in covered dishes. Put one in the dark and one in the light. In which does mold grow faster? Put another dish in a cold, dark place and one in a warm, dark place. In which dish does mold grow faster? The favorable conditions for the growth of mold are moisture, warmth and darkness. Why should moldy food be kept out of closets? Why are bread boxes scalded? Why do dry bread crumbs keep? Why should stored fruits and vegetables be examined for molds?

Problem 5. Where Do Mildews Come From?

Put an orange in a closed dish in a warm place, or bring a moldy orange to school. It is usually covered with a green or bluish green mass of powder, which is a mass of mildew spores. These spores are so light that they can float in the air. Each one is capable of starting a new growth. Plant a little on moist bread in a closed dish and keep in a warm, dark place. What happens? Why do starched clothes mildew in summer time? Where did the spores come from? Why do ironed or dried clothes not mildew?

Conclusions.

The plant body of molds and mildew consists of a tangled mass of delicate threads called the mycelium. Special root-like threads penetrate into the food substance on which they grow and absorb food. Other branches ascend from the mycelium and bear at their ends the sacs called sporangia. The protoplasm in the sporangium breaks up into many little spores. When ripe the sporangium breaks open and the spores float off into the air. In the powdery mildews the spores are usually born in chains at the end of the erect threads. Spores are very light and easily float in the air, and are always falling on things exposed to the dust. It is these spores that give the musty odor by which we detect molds before we can see the growing plants.

Black molds grow easily on bread. The mycelium is a beautiful white, but as the sporangia ripen the whole mass turns nearly black. Bread mold often causes a serious rot of stored vegetables, such as sweet potatoes, beets, etc., especially if the storage cellar is not well ventilated and is too warm.

The bluish and greenish mildews grow readily on bread, cheese, squash, fruits and starched clothes. One of these mildews is used by man to give the peculiar flavor to Roquefort cheese. Some mildews attack living plants and cause diseases such as the grape mildew and potato blight. Man is learning to hold these diseases in check by using proper sprays.

In nature all these plants help in the work of decay.

PROJECT III. A STUDY OF BACTERIA.

Introduction.

Put a handful of hay into a jar of water. The scum that collects on the top is a mass of bacteria.

Put a jar containing water plants in the window. The white scum is a mass of bacteria.

Look at "mother of vinegar." It is a mass of bacteria which changes the alcohol of cider into the acetic acid of vinegar.

Bacteria are tiny, but when millions grow into a lump we can see the mass (colony).

Preparation.

Bacteria will grow wherever suitable food is found. To study bacteria we need a food and a proper place to grow.

Food.

Peel three medium sized potatoes, wash, cut into slices. Boil in one quart of water ten minutes. Drain off one pint of potato water. Strain through fine, thin cloth. Add to the potato water one half ounce of agar cut in small pieces. Let stand ten minutes. Heat until dissolved. Strain through the cloth. Fill test tubes about two thirds full. Plug with cotton. Sterilize by standing in boiling water thirty minutes.

Petri Dishes.

Sterilize by heating in oven or fireless cooker one hour. When needed melt the potato agar by standing in hot water. In filling the Petri dishes hold the cover directly over the dish to prevent dust from falling in.

Problem 1. What is Living Dust?

Remove the cover from a Petri dish, and expose the potato agar to the air of the room for three minutes. Then recover and put the dish in a warm, dark place for a few days (three to seven). Watch to see the growth of the living dust. Little dots of various colors are colonies of bacteria, yeasts, mildews, or molds. How many different kinds do you see? Why are wounds bandaged? Why is food protected from dust?

Problem 2. Why Should Dust Cloths Never Be Shaken Indoors?

Shake a dust cloth in the air. Expose a Petri dish, as above, for one minute. How many colonies grow? How many different kinds? Why do we shake dust cloths out of doors? Why do we wash them?

Problem 3. Why Do Our Teeth Decay?

Push a common pin firmly into a pencil. Sterilize the head by passing through a flame. Let a pupil having a decayed tooth clean out the cavity with the head of the pin. Melt a tube of agar jelly, and stir the head of the pin in it. Pour into a sterilized Petri dish. Put in a dark, warm place. How many colonies develop? Why are decayed teeth a menace to health? Why should they be properly filled?

Problem 4. Why Should All Food Be Protected from Flies?

Fill a Petri dish with agar. Catch a fly. Carefully lift the cover of the Petri dish, and allow the fly to walk over the agar. Let the fly out, and put the Petri dish in a warm place for a few days. Watch the developing colonies. Why does a "swat the fly" compaign exist? Why does the Board of Health have a fly problem? Where do the flies come from? Why are houses screened?

Problem 5. Why Should the Hands Be Washed Before Handling Food?

Touch agar in a Petri dish with the finger tips. Put the dish in a warm place. Watch. Why should the hands be washed? Why should we keep our fingers out of our mouths?

Problem 6. Why Should Food Be Protected from Street Dust?

Expose a plate to the dust of the street for one minute — on a windy day for five seconds. Put in a warm place. Watch. Why is spitting in the street a bad practice?

Problem 7. Why Is Milk Pasteurized?

Melt a tube of agar, add a drop of milk, and pour into a Petri dish. When hardened, place in a warm, dark place. How many colonies develop? Milk contains so many bacteria that a drop gives usually innumerable colonies. Pasteurization kills most of the harmful bacteria. Pasteurized milk should be used as soon as possible after pasteurization, as spores of harmful bacteria are not killed.

Suggestions.

Teachers can try an almost endless number of things to answer questions asked.

Why sweep with a wet broom? Let pupil expose a plate at home after sweeping with a dry broom and another pupil expose a plate after sweeping with a dampened broom.

Why sweep with a carpet sweeper? Expose plates as above.

Why use a vacuum cleaner? Expose plates as above.

Compare the cultures. Which plate shows the fewest colonies? Which is the best method of sweeping?

Why cover the hair when working in the kitchen or Red Cross rooms?

Problem 8. Find Five Rules of the Board of Health Depending on Knowledge of Bacteria.

Pupils hunt up rules from posted notices, in cars, stores, etc.

Problem 9. How Is the Water Supply Protected?

Information collected from accounts of the city supply.

Conclusions.

Bacteria are the smallest living organisms. They are found growing wherever there is moisture, food material and a suitable temperature. They grow in water, soil and on the bodies of plants and animals. They are

found in a dry state attached to dust particles, and whenever dust falls in suitable places the bacteria begin to grow.

In nature, bacteria aid in the process of decay. To keep the world fit for living plants and animals, it is necessary that dead matter be broken into simple compounds such as water, carbon dioxide, and those containing nitrogen. These simple compounds are used by growing plants.

In the soil there are certain bacteria, which live on the roots of peas, clover, beans, alfalfa, etc., capable of fixing the nitrogen of the air into such a form that plants may use it. These bacteria help to make the soil fertile.

In the home and storage houses bacteria may cause the decay of foodstuffs. Such food is unfit for human beings, because in the process of decay, poisonous substances may be formed. The knowledge of bacteria has helped man to devise different ways of protecting his food supply from molds, mildew, yeasts and bacteria. As moisture is necessary for the growth of these plants, one method of preservation is drying (fruits, vegetables, bread crumbs, etc.). A second method is cold storage. Cold checks the growth of bacteria, molds and yeast. This method is used for meats, eggs, fruits, butter, etc. The temperature is varied to suit each thing. At home the refrigerator is used to check the growth of these plants. A third method is to use some substance such as salt, sugar, spices or vinegar which will prevent the bacteria growing. Sometimes a poisonous substance such as formalin is used. This should never be permitted. A fourth method is sterilization. In this method the foodstuff is heated for a sufficient time to kill all bacteria, and is then put into an air-tight, sterilized container. This method is the one the housewife uses to preserve fruits and vegetables for winter use. It has helped farmers, living at great distances from a market, to raise fruits and vegetables for canneries.

A knowledge of bacteria is the basis upon which modern sanitation has been built. Many of the Board

of Health rules are directly connected with facts of bacteriology. Laws have been made to protect citizens from ignorance and carelessness. The following requirements of the Board of Health illustrate this:

1. Articles of food offered for sale must not be exposed to flies, dust of the street, or animals.
2. Dirty paper or newspaper must not be used to wrap food in.
3. Milk and cream must be sold in tightly closed bottles.
4. Milk and cream offered for sale must be kept in clean coolers.
5. The Board of Health must be notified if anyone is sick of a contagious disease.
6. Children living in households in which there are contagious diseases must be kept from school.
7. No one must spit on the sidewalk, in the street cars or on the floors of public buildings.
8. All persons engaged in handling articles of food shall wear clean outer garments and be free from contagious or infectious disease.
9. It is unlawful to provide a common drinking cup in a public building, factory, office building, store, school, or railroad station.
10. No common towel allowed in places named above.
11. Public alleys must be kept free from filth.
12. No child shall be admitted to school until vaccinated unless a doctor certifies him unfit for vaccination.

Water and milk are both carriers of germs. The rules given show how important the Board of Health considers milk. Water is so important that the state has appointed the Metropolitan Water Board to care for the water supply of Boston. The people of Boston are provided with a constant and adequate amount of water. This water is constantly under the observation of trained bacteriologists, who regularly examine it to make sure that it is free from germs — especially the colon bacillus. This bacillus is taken to mean con-

tamination by human excreta, and is the danger signal. The brooks and streams flowing into the main reservoirs and the nearer reservoirs are guarded from ignorant or careless persons.

Modern treatment of disease depends in large measures upon bacteriology. Before people knew anything about bacteria it was known that persons having a disease were often "immune" from that disease thereafter. One of the most dreaded diseases was smallpox. It was often so virulent that great numbers died. Sometimes people would have themselves inoculated with the disease when they were especially well and strong, hoping to be able to resist the disease or to have it in a very light form. By so doing they would gain immunity. Sometimes it worked well, but at other times they would suffer the disease in the most severe way. At all times the persons would be a point of infection in the community.

In 1797 Doctor Jenner of England stated that he had noted that dairy workers, who had contracted the disease of cowpox, were immune to smallpox. He therefore suggested that people in England be inoculated with the virus of cowpox instead of using small pox virus. This method was so successful that it has practically freed the world from one dread disease.

Pasteur, the great French scientist, reasoned that the immunity gained by vaccination was due to some chemical substance formed in the blood. He thought cowpox germs were probably smallpox germs that living in the body of the cow had lost their power to produce smallpox in man.

This reasoning led Pasteur to try experiments with disease germs. He grew them under varying conditions as regarded food, temperature and time. He succeeded in growing anthrax bacilli under different conditions and obtained germs that were virulent, and others that were "attenuated." Attenuated germs were germs that had lost the power to cause disease. Pasteur found that attenuated germs could be used to give

immunity to anthrax. By a striking experiment he proved to the farmers of France that cattle and sheep treated with attenuated germs were immune to virulent anthrax germs. Sheep and cows were made immune and then an equal number of untreated animals were inoculated with virulent anthrax germs. The ones that had been made immune were not affected. The others either died or were desperately sick. His work led many investigators to search for the cause and prevention of diseases.

Diphtheria was a great scourge to mankind. The germs in growing formed a poison (toxin) which was rapidly absorbed by the blood, frequently causing death. An investigator found that a horse inoculated with diphtheria germs was able to quickly form a substance (anti-toxin) to neutralize the poison. After a few inoculations with germs the horse became immune and it was found that the blood serum of such a horse could be used to give immunity to man if attacked by diphtheria germs.

Other investigators have found ways to make serums which are used to render man immune to typhoid and one type of pneumonia. Many investigators are working along these lines today.

SPECIAL MATERIALS AND APPARATUS.

Petri dishes. Agar-agar. Cotton batting.

REFERENCE BOOKS.

Bacteria, Yeasts and Molds. Conn. D. Appleton & Co.
The Story of Germ Life. Conn. D. Appleton & Co.
Preventable Diseases. Woods Hutchinson. Houghton Mifflin Company.
The Science of Common Things. Tower and Lunt. D. C. Heath & Co.
A Civic Biology. Hunter. American Book Company.

(1,000-11-6-'22)

SCHOOL DOCUMENT NO. 15—1922

BOSTON PUBLIC SCHOOLS

ANNUAL STATISTICS OF THE BOSTON PUBLIC SCHOOLS

CALENDAR YEAR 1921
AND SCHOOL YEAR 1921-1922

BOSTON
PRINTING DEPARTMENT
1922

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In School Committee,
Boston, October 16, 1922.

To the School Committee:

I submit herewith the thirteenth annual report of the statistics of the Boston Public Schools.

The total registration in all schools during the year was 155,373; the average membership, 131,457; and the average number in daily attendance, 120,247. The total registration was 5,218 more than during the school year next preceding. The total registration was distributed as follows:

Regular day schools	131,789
Evening schools	15,309
Continuation school	6,753
Day School for Immigrants	1,522

The number of pupils registered in the Summer Review Schools was 5,849. This total of 5,849 is not included in the total registration because, with but few exceptions, these pupils were registered in the public day schools during the term ending in June, 1922.

The high and Latin schools showed an increase in registration of 2,725 pupils. The registration for the intermediate ninth grade of the elementary schools showed a total registration of 1,681, making a net total increase in the high and Latin schools of 2,937. The elementary grades (exclusive of the ninth) showed an increase of 1,889 pupils. The Continuation School showed a decrease of 1,518 pupils, and the special schools a decrease of 638. Other increases in registration throughout the city were as follows:

Normal School	34
Kindergartens	60
Special schools	362
Evening schools	1,678

The average number belonging in all day schools was 118,970, an increase of 5,560.

The total number of principals and teachers, including the members of the supervising staff, in the employ of the city June 30, 1922, was 3,601 — one hundred twelve more than on the corresponding day of the preceding year. The Normal School had three additional teachers; the day high and Latin schools had thirty-six additional; the day elementary schools fifty-five additional; the kindergartens eight additional. Of this number 3,601 — 570 were men and 3,031 women. The average number of pupils per teacher in the Normal School was seventeen, in the day high and Latin schools thirty-one, in the grades forty-two and in the kindergartens twenty-seven.

The number of classes of special types in the day elementary schools and the number of pupils belonging at the end of the school year was as follows:

	Number of Classes.	Number Belonging.
Conservation of Eyesight	7	90
Hospital Classes	3 *	36
Open-Air Classes	24	690
Pre-vocational	5	964
Rapid Advancement Classes	2	59
Special Classes	85	1,313
Special English Classes	28	871
Speech Improvement Classes (stammerers) (11 centers)	68	976
Ungraded Classes	11	256
Fort Strong	1	12

* Exclusive of class conducted at the Boston City Hospital.

The detailed reports of membership and attendance of pupils assigned to the classes mentioned above are included in the total of respective districts in which they were registered.

Summer Review Schools were reopened June 26 and were continued in session six days per week up to and including August 11, 1922. There was one summer review high school conducted in the Roxbury High Schoolhouse. There were ten summer review elementary schools.

Following is the summary of the distribution of children of public school grade in all day schools of the city for the past six years, based on the daily average number belonging:

School Year.	1916–17.	1917–18.	1918–19.	1919–20.	1920–21.	1921–22.
Public schools	107 153	106,690	106,743	109,110	113,410	118,970
Parochial schools	22,071	22,784	23,805	24,552	25,685	26,030

Respectfully yours,

Jeremiah E. Burke,
Superintendent of Public Schools.

GENERAL SUMMARIES.

AVERAGE MEMBERSHIP SCHOOL YEARS 1917–18 TO 1921–22.

Day Schools.	1917–18.	1918–19.	1919–20.	1920–21.	1921–22.
Normal	262	230	235	262	301
High and Latin	15,368	14,963	15,632	16,737	19,461
Elementary Grades	83,326	83,703	84,875	87,532	89,719
Kindergartens	6,879	7,059	7,489	7,881	8,172
Special Schools	855	788	879	998	1,317
Totals	106,690	106,743	109,110	113,410	118,970
Increase over previous year	* 463	53	2,367	4,300	5,560

* Decrease.

ENROLLMENT ON JUNE 30 OF EACH OF THE LAST FIVE YEARS

Day Schools.	1918.	1919.	1920.	1921.	1922.
Normal	254	227	234	282	297
High and Latin	13,612	13,815	14,294	15,979	18,301
Elementary Grades	82,520	83,219	84,390	87,770	89,374
Kindergartens	7,572	7,942	8,318	8,512	8,673
Special Schools	633	797	796	934	1,191
Totals	104,591	106,000	108,032	113,457	117,836

TOTAL REGISTRATION.

School Year Ending June 30, 1922.

	Boys.	Girls.	Total.
Normal	16	289	305
High and Latin	10,346	10,562	20,908
Elementary Grades	51,364	48,003	99,367
Kindergartens	4,999	4,643	9,642
Special Schools	675	892	1,567
Totals	67,400	64,389	131,789

SUMMARY.

School Year Ending June 30, 1922.

Schools.	Total Registration.	Average Number Belonging.	Average Attendance.	Per Cent of Attendance.	Number Enrolled June 30, 1922, of the Following Ages.				
					Under 5.	5 to 7.	7 to 14.	14 to 16.	16 and over.
Normal	305	301	290	96	.....	.....	.....	2	295
High and Latin	20,908	19,461	18,234	94	.....	.....	3,346	9,105	5,850
Elementary Grades	99,367	89,719	83,470	93	183	16,997	66,479	5,414	301
Kindergartens	9,642	8,172	6,540	80	6,678	1,988	7	.....	.....
Totals	130,222	117,653	108,534	92	6,861	18,985	69,832	14,521	6,446
Special Schools	1,567	1,317	1,171	89	1	18	193	553	426
All Day Schools (except The Continuation School)	131,789	118,970	109,705	92	6,862	19,003	70,025	15,074	6,872
Evening High	4,971	2,919	2,388	82	.....	.....	.....	.....	.....
Evening Elementary	9,523	4,895	3,861	79	.....	.....	.....	.....	.....
Boston Trade School (Evening Classes)	815	457	352	77	.....	.....	.....	.....	.....
Totals	15,309	8,271	6,601	80	.....	.....	.....	.....	.....
Continuation School	6,753	3,422	3,308	97	.....	.....	.....	.....	.....
Day School for Immigrants	1,522	794	633	80	.....	.....	.....	.....	.....
Totals of all Day and Evening Schools	155,373	131,457	120,247	91	.....	.....	.....	.....	.....

DAY SCHOOLS.

NORMAL, LATIN AND HIGH SCHOOLS.

School Year Ending June 30, 1922.

Schools.	Total Registration.	Average Number Belonging.			Average Attendance.			Average Absence.	Per Cent of Attendance.
		Boys.	Girls.	Total.	Boys.	Girls.	Total.		
Normal	305	16	285	301	16	274	290	11	96
High and Latin:									
Public Latin	1,350	1,219	.....	1,219	1,171	.....	1,171	48	96
Girls' Latin	964	.....	880	880	.....	842	842	38	96
Brighton High	765	293	454	747	269	421	690	57	92
Charlestown High	710	295	359	654	270	334	604	50	92
Dorchester High	2,481	802	1,437	2,239	727	1,305	2,032	207	91
East Boston High	1,092	462	551	1,013	431	514	945	68	93
English High	2,610	2,487	.....	2,487	2,327	.....	2,327	160	94
Girls' High	2,197	.....	2,053	2,053	.....	1,895	1,895	158	92
High School of Commerce	1,772	1,647	.....	1,647	1,577	.....	1,577	70	96
High School of Practical Arts	861	.....	815	815	.....	744	744	71	91
Hyde Park High	962	424	480	904	400	455	855	49	95
Mechanic Arts High	1,533	1,421	.....	1,421	1,353	.....	1,353	68	95
Roxbury High	1,658	.....	1,464	1,464	.....	1,375	1,375	89	94
South Boston High	959	355	554	909	338	528	866	43	95
West Roxbury High	994	243	766	1,009	233	725	958	51	95
Totals, Normal, High and Latin	21,213	9,664	10,998	19,762	9,112	9,412	18,524	1,238	94
Totals, High and Latin	20,908	9,648	9,813	19,461	9,096	9,138	18,234	1,227	94

ELEMENTARY GRADES.

School Year Ending June 30, 1922.

School Districts.	Total Registration.	Average Number Belonging.			Average Attendance.			Average Absence.	Per Cent. of Attendance
		Boys.	Girls.	Total.	Boys.	Girls.	Total.		
Abraham Lincoln	2,583	1,013	1,138	2,151	949	1,060	2,009	142	93
Agassiz	721	607	84	691	574	73	647	44	94
Bennett	1,814	878	812	1,690	822	752	1,574	116	93
Bigelow	1,106	788	156	944	749	145	894	50	95
Blackinton-John Cheverus	1,617	770	718	1,488	720	666	1,386	102	93
Bowditch	1,122	271	787	1,058	248	738	986	72	93
Bowdoin	881	177	593	770	164	550	714	56	93
Chapman	1,279	581	625	1,206	539	575	1,114	92	92
Charles Sumner	1,040	503	442	945	467	406	873	72	92
Christopher Gibson	1,180	528	467	995	491	427	918	77	92
Dearborn	2,030	1,055	837	1,892	987	781	1,768	124	93
Dillaway	1,327	301	862	1,163	274	789	1,063	100	91
Dudley	1,147	925	210	1,135	866	189	1,055	80	93
Dwight	925	620	219	839	587	198	785	54	94
Edmund P. Tileston	911	429	397	826	404	369	773	53	94
Edward Everett	1,730	740	767	1,507	696	715	1,411	96	94
Elihu Greenwood	1,464	678	617	1,295	628	571	1,199	96	93
Eliot	3,292	2,177	584	2,761	2,100	555	2,655	106	96
Emerson	1,524	732	718	1,450	679	662	1,341	109	92
Everett	990	207	616	823	186	574	760	63	92
Francis Parkman	752	346	350	696	325	329	654	42	94
Franklin	1,058	326	693	1,019	300	640	940	79	92
Frederic W. Lincoln	779	576	129	705	550	120	670	35	95
Gaston	1,142	201	843	1,044	189	798	987	57	95
George Putnam	1,466	674	728	1,402	622	668	1,290	112	92
Gilbert Stuart	809	362	339	701	336	314	650	51	93
Hancock	2,665	475	1,878	2,353	449	1,791	2,240	113	95
Harvard-Frothingham	1,293	596	542	1,138	556	504	1,060	78	93
Henry Grew	849	399	384	783	370	355	725	58	93
Henry L. Pierce	1,858	860	883	1,743	797	812	1,609	134	92
Hugh O'Brien	1,621	944	621	1,565	886	574	1,460	105	93
Hyde	732	142	565	707	126	515	641	66	91
Jefferson	1,473	676	661	1,337	642	629	1,271	66	95
John A. Andrew	1,120	564	460	1,024	532	429	961	63	94
John Marshall	1,428	650	606	1,256	601	555	1,156	100	92

ELEMENTARY GRADES.

School Year Ending June 30, 1922.—Concluded.

School Districts	Total Registration.	Average Number Belonging.			Average Attendance.			Average Absence.	Per Cent of Attendance.
		Boys.	Girls.	Total.	Boys.	Girls.	Total.		
John Winthrop	1,754	834	818	1,652	768	748	1,516	126	92
Julia Ward Howe	1,148	571	485	1,056	525	444	969	87	92
Lawrence	1,028	673	199	872	650	188	838	34	96
Lewis	1,677	791	784	1,575	721	696	1,417	158	90
Longfellow	1,366	618	640	1,258	579	591	1,170	88	93
Lowell	1,184	557	549	1,106	528	517	1,045	61	94
Martin	737	279	268	547	259	251	510	37	93
Mary Hemenway	2,251	1,068	1,078	2,146	991	991	1,982	164	92
Mather	2,635	1,337	1,168	2,505	1,251	1,079	2,330	175	93
Minot	618	286	279	565	265	257	522	43	92
Norcross	1,055	231	757	988	217	716	933	55	94
Oliver Hazard Perry	806	392	393	785	369	363	732	53	93
Oliver Wendell Holmes	1,137	506	532	1,038	475	493	968	70	93
Phillips Brooks	1,654	749	770	1,519	683	698	1,381	138	91
Prescott	880	415	307	722	388	286	674	48	93
Prince	1,165	472	488	960	433	442	875	85	91
Quincy	1,307	809	223	1,032	762	203	965	67	94
Rice	1,140	547	419	966	509	384	893	73	92
Robert Gould Shaw	1,624	719	687	1,406	675	644	1,319	87	94
Roger Wolcott	2,903	1,316	1,232	2,548	1,212	1,127	2,339	209	92
Samuel Adams	3,055	1,333	1,346	2,679	1,262	1,256	2,518	161	94
Sherwin	977	674	203	877	623	182	805	72	92
Shurtleff	975	198	659	857	182	616	798	59	93
Theodore Lyman	1,712	845	736	1,581	801	691	1,492	89	94
Thomas Gardner	1,492	727	655	1,382	688	615	1,303	79	94
Thomas N. Hart	1,182	906	149	1,055	863	140	1,003	52	95
Ulysses S. Grant	1,594	750	712	1,462	686	658	1,344	118	92
Warren-Bunker Hill	1,871	810	795	1,605	755	740	1,495	110	93
Washington	1,789	850	784	1,634	801	734	1,535	99	94
Washington Allston	1,324	563	550	1,113	526	506	1,032	81	93
Wells	1,926	563	1,226	1,789	519	1,137	1,656	133	93
Wendell Phillips	1,442	1,277	71	1,348	1,184	65	1,249	99	93
William E. Endicott	2,221	1,083	1,038	2,121	983	932	1,915	206	90
William E. Russell	990	483	437	920	450	404	854	66	93
William Lloyd Garrison	1,000	515	433	948	467	387	854	94	90
Totals	99,367	46,518	43,201	89,719	43,461	40,009	83,470	6,249	93

KINDERGARTENS.

School Year Ending June 30, 1922.

School Districts.	Total Registration.	Average Number Belonging.			Average Attendance.			Average Absence.	Per Cent. of Attendance.
		Boys.	Girls.	Total.	Boys.	Girls.	Total.		
Abraham Lincoln	101	40	36	76	32	27	59	17	78
Agassiz	57	27	25	52	19	18	37	15	71
Bennett	218	92	86	178	69	65	134	44	75
Bigelow	74	37	24	61	30	19	49	12	80
Blackinton-John Cheverus	171	81	74	155	62	60	122	33	79
Bowditch	108	51	56	107	40	42	82	25	77
Bowdoin	145	62	49	111	51	39	90	21	81
Chapman	122	57	44	101	45	35	80	21	79
Charles Sumner	158	56	66	122	42	52	94	28	77
Christopher Gibson	55	29	20	49	22	16	38	11	78
Dearborn	134	49	57	106	41	47	88	18	83
Dillaway	153	63	60	123	47	44	91	32	74
Dudley	133	57	43	100	47	35	82	18	82
Dwight	67	33	20	53	27	18	45	8	85
Edmund P. Tileston	105	44	49	93	35	39	74	19	80
Edward Everett	115	52	43	95	43	35	78	17	82
Elihu Greenwood	167	75	65	140	57	49	106	34	76
Eliot	110	53	52	105	48	47	95	10	90
Emerson	139	66	59	125	55	46	101	24	81
Everett	59	30	26	56	23	19	42	14	75
Francis Parkman	103	44	44	88	38	38	76	12	86
Franklin	124	54	52	106	43	43	86	20	81
Frederic W. Lincoln	82	42	33	75	36	28	64	11	85
Gaston	51	29	21	50	24	17	41	9	82
George Putnam	113	44	40	84	34	32	66	18	79
Gilbert Stuart	123	44	52	96	32	38	70	26	73
Hancock	498	185	193	378	165	173	338	40	89
Harvard-Frothingham	190	68	80	148	55	63	118	30	80
Henry Grew	148	68	54	122	53	41	94	28	77
Henry L. Pierce	139	49	49	98	40	41	81	17	83
Hugh O'Brien	165	83	60	143	67	47	114	29	80
Hyde	135	53	55	108	43	41	84	24	78
Jefferson	165	71	63	134	57	50	107	27	80
John A. Andrew	69	33	22	55	27	17	44	11	80
John Marshall	152	66	72	138	54	57	111	27	80

KINDERGARTENS.

School Year Ending June 30, 1922.—Concluded.

School Districts.	Total Registration.	Average Number Belonging.			Average Attendance.			Average Absence.	Per Cent of Attendance.
		Boys.	Girls.	Total.	Boys.	Girls.	Total.		
John Winthrop	121	64	47	111	50	34	84	27	76
Julia Ward Howe	57	27	24	51	23	19	42	9	82
Lawrence	37	16	13	29	13	10	23	6	79
Lewis	121	43	63	106	34	48	82	24	77
Longfellow	92	43	46	89	31	36	67	22	76
Lowell	122	52	53	105	43	43	86	19	82
Martin	125	55	50	105	45	32	77	28	73
Mary Hemenway	167	67	81	148	52	60	112	36	76
Mather	214	101	84	185	85	71	156	29	84
Minot	46	23	21	44	18	18	36	8	82
Norcross	99	49	40	89	41	32	73	16	82
Oliver Hazard Perry	56	29	24	53	24	19	43	10	81
Phillips Brooks	222	88	103	191	69	80	149	42	78
Prescott	67	30	23	53	22	15	37	16	70
Prince	93	26	30	56	19	22	41	15	73
Quincy	244	104	87	191	88	75	163	28	85
Rice	59	28	24	52	22	20	42	10	81
Robert Gould Shaw	118	57	41	98	48	34	82	16	84
Roger Wolcott	248	128	141	269	104	116	220	49	82
Samuel Adams	374	174	160	334	141	128	269	65	81
Sherwin	29	14	9	23	11	7	18	5	78
Shurtleff	124	42	43	85	32	33	65	20	76
Theodore Lyman	232	99	81	180	81	67	148	32	82
Thomas Gardner	164	72	77	149	57	64	121	28	81
Thomas N. Hart	121	61	52	113	50	41	91	22	81
Ulysses S. Grant	187	80	81	161	70	70	140	21	87
Warren-Bunker Hill	180	78	77	155	63	52	115	40	74
Washington	187	73	84	157	61	69	130	27	83
Washington Allston	117	55	33	88	43	25	68	20	77
Wells	231	87	110	197	69	90	159	38	81
Wendell Phillips	50	23	29	52	19	23	42	10	81
William E. Endicott	370	161	178	339	128	137	265	74	78
William E. Russell	122	53	44	97	42	31	73	24	75
William Lloyd Garrison	203	104	82	186	78	62	140	46	75
Totals	9,642	4,193	3,979	8,172	3,379	3,161	6,540	1,632	80

SPECIAL SCHOOLS.

School Year Ending June 30, 1922.

Schools.	Total Registration.	Average Number Belonging.			Average Attendance.			Average Absence.	Per Cent of Attendance.
		Boys.	Girls.	Total.	Boys.	Girls.	Total.		
Horace Mann School	169	78	86	164	71	73	144	20	88
Boston Clerical School	280	.....	217	217	.....	193	193	24	89
Boston Disciplinary Day School	48	43	.....	43	35	.....	35	8	81
Boston Trade School	548	469	.....	469	434	.....	434	35	93
Trade School for Girls	522	.....	424	424	.....	365	365	59	86
Totals	1,567	590	727	1,317	540	631	1,171	146	89

TRADE SCHOOLS.

Total Registration by Departments, School Year Ending June 30, 1922.

BOSTON TRADE SCHOOL.

Department.	Day.		Evening.
	Complete Enrollment.	Original Enrollment.	
Electrical	98	92	103
Machine	133	131	227
Printing	60	58	53
Sheet Metal	57	54	52
Woodworking	99	99	85
Auto Mechanics	92	89	152
Firing and Engineering	.....	.....	26
Trade drawing and shop mathematics	.....	.....	113
Totals	539	523	811

TRADE SCHOOL FOR GIRLS.

Department.	Day.	Extension.	Total.
Dressmaking	392	88	480
Millinery	131	46	177
Operating	84	56	140
Catering	30	28	58
Totals	637	218	855

Summer Term 1922.

Total registration	170
Average number belonging	158
Average attendance	142
Per cent of attendance	90
Length of term—July 10 to August 25:	
Number of teachers employed, July	11
Number of teachers employed, August	11
Part time extension:	
Number enrolled	5
Hours of attendance	135

DISTRIBUTION OF PUPILS IN RESPECT BOTH

The age given is

	Grades.		4 Years and Under.	5 Years.	6 Years.	7 Years.	8 Years.	9 Years.	10 Years.
Normal School.	All Grades	Males							
		Females							
	Totals								
High and Latin Schools.	Post-Graduate Course	Boys							
		Girls							
	Fourth-year Group	Boys							
		Girls							
	Third-year Group	Boys							
		Girls							
	Second-year Group	Boys							
		Girls							
	First-year Group	Boys							
		Girls							
	Out-of-Course Group	Boys							
		Girls							
	V. Class Latin Schools	Boys							
		Girls							2
	VI. Class Latin Schools	Boys							7
		Girls							15
	Totals								24
Intermediate.	Ninth Grade	Boys							
		Girls							
	Totals								
Elementary Schools.	Eighth Grade	Boys							4
		Girls							2
	Seventh Grade	Boys						4	132
		Girls						4	126
	Sixth Grade	Boys				2		117	1,365
		Girls					1	163	1,479
	Fifth Grade	Boys				3	89	1,429	1,763
		Girls				1	118	1,472	1,665
	Fourth Grade	Boys			1	101	1,666	1,947	1,161
		Girls			3	131	1,733	1,758	881
	Ungraded	Boys	1	1		1	32	40	36
		Girls	1		2	2	12	22	17
	Third Grade	Boys			113	2,008	2,028	889	315
		Girls			114	2,031	1,997	816	246
	Second Grade	Boys		57	2,282	2,343	907	300	87
		Girls		91	2,343	2,175	781	222	62
	First Grade	Boys	94	3,567	2,594	814	189	56	19
		Girls	87	3,389	2,274	627	135	40	19
	Special Classes	Boys		1	10	88	128	144	136
		Girls			11	28	62	83	61
	Prevocational Classes	Boys							
		Girls							
	Special English Classes	Boys		3	7	14	43	57	59
		Girls			1	8	37	59	44
	Open-air Classes	Boys		12	48	67	90	44	17
		Girls		10	56	103	107	73	41
	Rapid Advancement Classes	Boys							9
		Girls						1	11
	Conservation of Eyesight Classes	Boys				2	4	2	9
		Girls				1	1	6	8
	Hospital Classes	Boys			1	1	2	1	5
		Girls		2	1	1	2	3	3
	Fort Strong	Boys			2	2		2	
		Girls		1		2	2	1	
	Totals		183	7,134	9,863	10,556	10,166	9,755	9,782

TO AGE AND TO GRADE JUNE 30, 1922.

that of September 1, 1921.

11 Years.	12 Years.	13 Years.	14 Years.	15 Years.	16 Years.	17 Years.	18 Years.	19 Years.	20 Years.	21 Years.	Over 21 Years.	Totals.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16	16
.....	.....	.....	.....	2	16	68	94	52	26	6	17	281
.....	.....	.....	.....	**2**	**16**	**68**	**94**	**52**	**26**	**6**	**33**	**297**
.....	.....	.....	.....	2	2	11	9	7	1	2	7	41
.....	.....	.....	.....	.....	4	7	14	2	9	1	1	38
.....	.....	.....	13	139	523	447	167	43	10	3	4	1,349
.....	.....	.....	12	143	749	502	168	28	3	1	1	1,613
.....	.....	17	173	674	572	232	63	10	1	2	1	1,745
.....	.....	6	164	774	675	226	72	11	.....	.....	1	1,929
.....	10	192	986	882	383	85	26	1	1	.....	.....	2,566
.....	5	198	1,072	993	359	84	17	2	.....	.....	.....	2,730
4	206	1,120	1,073	516	114	26	2	1	1	.....	1	3,064
9	153	1,071	1,024	442	108	14	.....	3	.....	.....	.....	2,824
.....	.....	.....	.....	.....	2	6	1	3	3	.....	.....	15
.....	.....	.....	.....	.....	.....	4	.....	2	1	.....	1	8
6	40	24	6	1	.....	.....	.....	.....	.....	.....	.....	77
4	25	31	6	.....	.....	.....	.....	.....	.....	.....	.....	68
38	48	22	6	.....	1	.....	.....	.....	.....	.....	.....	122
44	33	16	2	2	.....	.....	.....	.....	.....	.....	.....	112
105	**520**	**2,697**	**4,537**	**4,568**	**3,492**	**1,650**	**539**	**113**	**30**	**9**	**17**	**18,301**
1	41	245	235	104	18	4	.....	.....	.....	.....	.....	648
1	48	386	348	121	24	2	.....	.....	1	.....	.....	931
2	**89**	**631**	**583**	**225**	**42**	**6**	.....	.....	**1**	.....	.....	**1,579**
143	1,258	1,453	780	264	36	5	.....	.....	.....	.....	.....	3,943
130	1,380	1,444	742	219	47	8	5	.....	.....	.....	.....	3,977
1,289	1,452	936	419	110	20	1	.....	.....	.....	.....	.....	4,363
1,421	1,534	883	335	74	15	4	.....	.....	.....	.....	.....	4,396
1,593	1,017	494	255	83	18	3	.....	.....	.....	.....	.....	4,947
1,625	845	413	184	50	8	.....	.....	.....	.....	.....	.....	4,768
1,016	530	234	115	37	5	.....	1	.....	.....	.....	.....	5,222
852	431	139	60	13	2	.....	1	.....	.....	.....	.....	4,754
451	201	91	41	20	5	.....	2	.....	.....	.....	.....	5,687
335	125	42	24	7	3	.....	.....	.....	.....	.....	.....	5,042
20	10	6	3	2	.....	.....	.....	.....	.....	.....	.....	152
21	13	9	3	2	.....	.....	.....	.....	.....	.....	.....	104
82	23	13	4	2	1	.....	.....	.....	.....	.....	.....	5,478
55	24	6	4	1	.....	.....	.....	.....	.....	.....	.....	5,294
16	4	3	1	1	.....	.....	.....	.....	.....	.....	.....	6,001
22	7	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	5,704
8	2	.....	5	1	.....	.....	.....	.....	.....	.....	.....	7,349
3	3	1	1	.....	.....	.....	.....	.....	.....	.....	.....	6,579
130	92	76	52	16	.....	.....	.....	.....	.....	.....	.....	873
63	43	31	27	21	7	3	.....	.....	.....	.....	.....	440
17	137	240	268	110	17	1	2	.....	.....	.....	.....	792
13	25	50	46	26	10	2	.....	.....	.....	.....	.....	172
59	67	43	38	34	4	2	5	.....	.....	.....	.....	435
69	60	61	58	30	8	1	.....	.....	.....	.....	.....	436
2	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	282
11	5	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	408
17	4	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	31
12	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	28
13	8	8	7	1	.....	.....	.....	.....	.....	.....	.....	54
8	4	3	2	3	.....	.....	.....	.....	.....	.....	.....	36
1	3	2	1	1	.....	.....	.....	.....	.....	.....	.....	18
1	1	2	1	1	.....	.....	.....	.....	.....	.....	.....	18
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6
9,498	**9,312**	**6,688**	**3,477**	**1,129**	**206**	**30**	**16**	.....	.....	.....	.....	**87,795**

DISTRIBUTION OF PUPILS IN RESPECT BOTH

The age given is that of

	Grades.		4 Years and Under.	5 Years.	6 Years.	7 Years.	8 Years.	9 Years.	10 Years.
Kindergartens.	All Grades	Boys	3,386	1,018	64	4	.....	.....	.....
		Girls	3,292	832	74	3	.....	.....	.....
	Totals	.....	**6,678**	**1,850**	**138**	**7**	.....	.....	.....
Special Schools.	Disciplinary Day School	Boys	.....	.....	.....	.....	.....	1	9
	Horace Mann	Boys	1	4	10	7	3	6	9
		Girls	.....	2	2	6	13	2	10
	Trade School for Girls	Girls	.....	.....	.....	.....	.....	.....	.....
	Boston Trade School	Boys	.....	.....	.....	.....	.....	.....	.....
	Boston Clerical School	Girls	.....	.....	.....	.....	.....	.....	.....
	Totals	.....	**1**	**6**	**12**	**13**	**16**	**9**	**28**
	Totals all Day Schools	.....	**6,862**	**8,990**	**10,013**	**10,576**	**10,182**	**9,764**	**9,834**

TO AGE AND TO GRADE JUNE 30, 1922.

September 1, 1921.— Concluded.

11 Years.	12 Years.	13 Years.	14 Years.	15 Years.	16 Years.	17 Years.	18 Years.	19 Years.	20 Years.	21 Years.	Over 21 Years.	Totals.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,472
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,201
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	**8,673**
4	11	17	12	.....	.....	.....	.....	.....	.....	.....	.....	54
6	6	11	6	6	6	3	.....	.....	.....	.....	.....	84
6	5	17	5	5	8	4	5	.....	.....	.....	.....	90
.....	.....	44	153	118	39	21	6	6	1	1	12	401
.....	.....	.....	105	120	79	26	14	1	1	3	53	402
.....	.....	.....	1	22	20	54	32	17	8	5	1	160
16	**22**	**89**	**282**	**271**	**152**	**108**	**57**	**24**	**10**	**9**	**66**	**1,191**
9,621	**9,943**	**10,105**	**8,879**	**6,195**	**3,908**	**1,862**	**706**	**189**	**67**	**24**	**116**	**117,836**

CALENDAR YEAR 1921.

NORMAL, LATIN AND HIGH SCHOOLS.

Membership, Attendance and Absence.

School Districts.	Average Number Belonging.	Average Attendance.	Average Absence.
Normal	278	270	8
High and Latin Schools:			
Public Latin	1,110	1,068	42
Girls' Latin	836	803	33
Brighton High	653	610	43
Charlestown High	558	519	39
Dorchester High	2,106	1,939	167
East Boston High	874	816	58
English High	2,265	2,125	140
Girls' High	2,002	1,840	162
High School of Commerce	1,519	1,465	54
High School of Practical Arts	685	637	48
Hyde Park High	836	797	39
Mechanic Arts High	1,290	1,238	52
Roxbury High	1,362	1,289	73
South Boston High	849	814	35
West Roxbury High	928	887	41
High and Latin Totals	17,873	16,847	1,026

CALENDAR YEAR 1921.

ELEMENTARY GRADES AND KINDERGARTEN.

Membership, Attendance and Absence.

School Districts.	Average Number Belonging.	Average Attendance.	Average Absence.
Abraham Lincoln	2,200	2,047	153
Agassiz	740	687	53
Bennett	1,804	1,666	138
Bigelow	979	929	50
Blackinton-John Cheverus	1,611	1,481	130
Bowditch	1,169	1,077	92
Bowdoin	878	805	73
Chapman	1,284	1,186	98
Charles Sumner	1,084	1,006	78
Christopher Gibson	1,047	964	83
Dearborn	1,929	1,803	126
Dillaway	1,254	1,135	119
Dudley	1,226	1,130	96
Dwight	854	796	58
Edmund P. Tileston	909	837	72
Edward Everett	1,625	1,522	103
Elihu Greenwood	1,427	1,305	122
Eliot	2,789	2,690	99
Emerson	1,546	1,426	120
Everett	853	773	80
Francis Parkman	760	717	43
Franklin	1,113	1,019	94
Frederic W. Lincoln	779	733	46
Gaston	1,066	1,006	60
George Putnam	1,462	1,346	116
Gilbert Stuart	821	755	66
Hancock	2,659	2,521	138
Harvard-Frothingham	1,229	1,140	89
Henry Grew	842	763	79
Henry L. Pierce	1,836	1,704	132
Hugh O'Brien	1,676	1,563	113
Hyde	805	728	77
Jefferson	1,452	1,368	84
John A. Andrew	1,069	1,006	63

ELEMENTARY GRADES AND KINDERGARTENS.— *Concluded.*

School Districts.	Average Number Belonging.	Average Attendance.	Average Absence.
John Marshall	1,375	1,254	121
John Winthrop	1,751	1,600	151
Julia Ward Howe	1,114	1,023	91
Lawrence	874	843	31
Lewis	1,636	1,463	173
Longfellow	1,362	1,281	81
Lowell	1,217	1,146	71
Martin	650	598	52
Mary Hemenway	2,294	2,112	182
Mather	2,653	2,480	173
Minot	603	555	48
Norcross	1,059	998	61
Oliver Hazard Perry	829	771	58
Oliver Wendell Holmes	1,041	979	62
Phillips Brooks	1,707	1,541	166
Prescott	704	658	46
Prince	1,009	916	93
Quincy	1,238	1,146	92
Rice	993	922	71
Robert Gould Shaw	1,444	1,349	95
Roger Wolcott	3,109	2,843	266
Samuel Adams	2,981	2,755	226
Sherwin	892	827	65
Shurtleff	883	818	65
Theodore Lyman	1,718	1,608	110
Thomas Gardner	1,623	1,523	100
Thomas N. Hart	1,156	1,084	72
Ulysses S. Grant	1,595	1,416	179
Warren-Bunker Hill	1,783	1,660	123
Washington	1,807	1,687	120
Washington Allston	1,170	1,091	79
Wells	1,942	1,781	161
Wendell Phillips	1,378	1,278	100
William E. Endicott	2,115	1,898	217
William E. Russell	1,050	971	79
William Lloyd Garrison	1,083	954	129
Totals for Elementary Schools	96,615	89,463	7,152

CALENDAR YEAR 1921.

SPECIAL SCHOOLS.

Special Schools.	Average Number Belonging.	Average Attendance.	Average Absence.
Horace Mann School	153	136	17
Boston Clerical School	185	171	14
Boston Disciplinary Day School	45	34	11
Boston Trade School	429	398	31
Trade School for Girls	326	286	40
Totals	1,138	1,025	113

NUMBER OF PUPILS PER TEACHER.

January 31.	Normal. (Excluding Head Master.)	High and Latin. (Excluding Head Masters.)	Elementary.	
			Grades. (Excluding Principals.)	Kindergartens.
1898	26 9	28.2	49.5	30.9
1899	26.1	28.0	51.4	29.0
1900	23.1	27.9	52.7	29.4
1901	18.9	27.5	49.8	28.6
1902	18.7	25.8	48.9	28.6
1903	18.8	26.4	48.0	28.5
1904	19.3	26.5	48.3	27.1
1905	19.9	27.3	48.4	28.5
1906	20.3	27.4	48.2	28.1
1907	17.0	26.9	47.9	26.8
1908	16.4	26.9	47.1	27.4
1909	14.0	29.2	45.6	25.7
1910	15.6	27.5	43.6	25.6
1910–11	16.0	28.9	42.2	23.4
1911–12	16.1	28.8	40.3	25.9
1912–13	14.0	27.8	42.7	25.4
1913–14	13.4	29.4	43.4	25.6
1914–15	15.4	31.2	42.9	27.4
1915–16	19.0	30.8	42.4	27.5
1916–17	19.6	30.3	41.4	23.9
1917–18	16.3	28.1	40.9	25.5
1918–19	15.3	26.7	40.1	25.4
1919–20	14.7	27.6	41.2	26.1
1920–21	16.4	28.8	42.4	26.9
1921–22 *	16.7	30.1	41.8	27.1

* The average number of teachers for the school year 1921–22 was: Normal, 18; Latin and high, 647; elementary grades, 2,148; kindergartens, 302.

ELEMENTARY SCHOOL PUPILS PROMOTED.

June 30, 1922.

District.	Grade IX.	Grade VIII.	Grade VII.	Grade VI.	Grade V.	Grade IV.	Grade III.	Grade II.	Grade I.	Ungraded.	Special English Class.	Special Class.	Open-Air Class.	Rapid Advancement Class.	Prevocational Class.	Conservation of Eyesight Class.	Kindergartens.	Total.
Abraham Lincoln	117	168	202	214	204	245	186	198	204	.....	96	7	28	.....	.....	.....	64	1,933
Agassiz	.....	66	66	98	75	86	56	54	54	.....	.....	3	.....	.....	27	.....	52	637
Bennett	.....	166	142	200	183	198	206	204	252	.....	.....	25	.....	.....	.....	.....	216	1,792
Bigelow	64	104	100	86	114	113	64	103	79	.....	.....	2	.....	.....	.....	.....	56	885
Blackinton-John Cheverus	.....	147	134	151	154	164	169	192	183	.....	.....	3	.....	.....	.....	8	139	1,444
Bowditch	.....	92	85	111	104	72	144	142	170	.....	.....	.....	25	.....	.....	.....	100	1,045
Bowdoin	.....	58	87	68	40	43	68	69	104	.....	63	21	108	.....	.....	.....	92	821
Chapman	.....	118	116	102	114	137	151	135	173	.....	.....	7	.....	.....	.....	.....	104	1,157
Charles Sumner	.....	110	114	77	82	120	156	102	131	.....	.....	.....	.....	.....	.....	.....	128	1,020
Christopher Gibson	.....	156	174	127	130	142	76	70	80	.....	.....	.....	.....	.....	.....	.....	45	1,000
Dearborn	.....	93	113	150	176	170	222	271	282	.....	27	17	.....	.....	82	.....	113	1,716
Dillaway	.....	97	110	122	108	112	166	178	179	.....	.....	8	.....	.....	.....	.....	113	1,193
Dudley	.....	73	68	61	100	111	120	130	141	.....	.....	2	.....	.....	90	9	70	975
Dwight	.....	68	81	88	92	98	43	78	82	14	.....	.....	25	.....	.....	.....	47	716
Edmund P. Tileston	.....	81	58	59	73	90	98	104	117	.....	.....	.....	*36	.....	.....	.....	81	797

Edward Everett	.....	127	145	173	146	176	218	193	181	.....	.....	.....	.....	.....	.....	.....	101	1,460
Elihu Greenwood	.....	146	138	153	140	151	155	146	187	.....	.....	.....	.....	.....	.....	.....	127	1,343
Eliot	.....	101	134	206	259	268	272	364	407	†79	95	9	.....	.....	30	.....	103	2,327
Emerson	79	89	122	123	150	165	184	171	177	.....	.....	.....	.....	.....	.....	.....	109	1,369
Everett	.....	64	69	73	78	80	90	132	158	.....	.....	.....	.....	.....	.....	.....	49	793
Francis Parkman	.....	72	72	81	77	75	79	89	105	.....	.....	.....	.....	.....	.....	.....	79	729
Franklin	.....	56	65	66	69	69	164	164	224	.....	.....	5	.....	.....	.....	23	99	1,004
Frederic W. Lincoln	.....	55	55	60	64	52	96	91	99	.....	.....	.....	.....	.....	.....	.....	62	634
Gaston	65	84	116	127	130	123	123	103	97	.....	.....	.....	.....	.....	.....	.....	48	1,016
George Putnam	137	228	213	112	123	114	105	118	117	.....	.....	20	.....	.....	.....	.....	88	1,375
Gilbert Stuart	.....	70	62	55	44	77	90	109	106	.....	.....	.....	.....	.....	.....	.....	89	702
Hancock	56	93	124	148	213	242	203	235	307	72	118	13	99	.....	23	.....	294	2,240
Harvard-Frothingham	.....	113	119	118	114	117	131	139	139	.....	.....	.....	.....	.....	.....	8	132	1,130
Henry Grew	.....	74	75	91	111	86	92	96	103	.....	.....	.....	.....	.....	.....	.....	113	841
Henry L. Pierce	83	156	166	173	172	190	194	185	197	.....	.....	15	.....	.....	.....	.....	97	1,628
Hugh O'Brien		170	174	206	180	214	175	174	150	.....	.....	7	.....	.....	.....	.....	134	1,584
Hyde	.....	45	50	56	67	82	73	75	93	.....	.....	10	.....	.....	46	.....	92	689
Jefferson*	.....	123	140	125	159	157	160	148	167	.....	.....	10	.....	.....	.....	.....	117	1,306
John A. Andrew	.....	74	91	91	105	106	111	99	96	.....	.....	.....	.....	.....	.....	.....	51	824
John Marshall	.....	.....	.....	196	157	178	237	207	219	.....	.....	14	.....	.....	.....	.....	148	1,356
John Winthrop	92	113	137	163	168	163	216	208	216	.....	28	12	.....	.....	.....	.....	108	1,624
Julia Ward Howe	.....	.....	.....	156	140	148	168	178	180	.....	.....	3	.....	.....	.....	.....	50	1,023

* Hospital classes.

† Includes six pupils at Fort Strong School.

ELEMENTARY SCHOOL PUPILS PROMOTED.

June 30, 1922.—Concluded.

	Grade IX.	Grade VIII.	Grade VII.	Grade VI.	Grade V.	Grade IV.	Grade III.	Grade II.	Grade I.	Ungraded.	Special English Class.	Special Class.	Open-Air Class.	Rapid Advancement Class.	Prevocational Class.	Conservation of Eyesight Class.	Kindergartens.	Total.
Lawrence	.....	51	56	80	79	86	117	136	131	.....	.....	6	.....	.....	59	.....	31	832
Lewis	209	257	264	153	142	167	120	112	112	.....	.....	.....	.....	.....	.....	.....	104	1,640
Longfellow	.....	133	135	117	136	181	138	167	171	.....	.....	3	.....	.....	.....	.....	87	1,268
Lowell	.....	113	121	130	125	110	112	104	128	.....	.....	5	21	.....	.....	.....	93	1,062
Martin	.....	61	39	64	42	55	62	72	72	.....	.....	.....	.....	.....	.....	12	81	560
Mary Hemenway	145	189	189	218	220	245	225	247	239	.....	.....	.....	.....	.....	.....	.....	143	2,060
Mather	.....	206	238	244	224	257	273	330	324	.....	.....	2	.....	.....	103	.....	175	2,376
Minot	.....	68	76	78	72	66	63	63	65	.....	.....	.....	.....	.....	.....	.....	45	596
Norcross	.....	76	102	101	74	53	105	116	141	.....	28	.....	81	.....	.....	10	88	975
Oliver Hazard Perry	.....	73	92	71	89	84	88	86	87	6	.....	4	.....	.....	.....	.....	51	731
Oliver Wendell Holmes	260	284	304	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	848
Phillips Brooks	.....	109	90	139	173	192	201	199	188	.....	24	5	.....	59	.....	.....	172	1,551
Prescott	.....	62	50	72	73	68	80	87	107	.....	.....	5	.....	.....	59	.....	37	700
Prince	.....	96	107	105	118	111	84	109	89	.....	.....	.....	.....	.....	.....	.....	53	872
Quincy	.....	56	66	70	51	99	79	80	145	15	39	8	80	.....	82	.....	159	1,029

Rice		105	113	125	115	160	78	78	84								52	910
Robert Gould Shaw	83	121	129	134	129	185	159	172	179			12					118	1,421
Roger Wolcott		283	282	256	265	219	270	336	335								246	2,492
Samuel Adams		161	184	239	280	304	309	399	499			3					277	2,655
Sherwin		35	60	66	78	84	91	108	93						60		23	698
Shurtleff		63	82	65	84	101	119	107	139	28							69	857
Theodore Lyman		76	82	117	150	170	180	194	223		8	9			177		174	1,560
Thomas Gardner		100	130	136	145	153	180	208	200								142	1,394
Thomas N. Hart		103	100	65	102	98	144	147	152								112	1,023
Ulysses S. Grant	79	94	100	126	127	150	191	180	179		45	18					168	1,457
Warren-Bunker Hill		171	149	172	153	194	196	200	210			2					125	1,572
Washington		105	99	132	136	156	163	206	277			14	54				139	1,481
Washington Allston		131	125	134	144	139	110	115	144								80	1,122
Wells		138	117	120	118	72	264	257	295		98	8	83			9	180	1,759
Wendell Phillips		175	179	189	195	193	37	57	61		10	9	29				43	1,177
William E. Endicott				281	279	251	365	382	367		4	18					341	2,288
William E. Russell		109	100	105	113	109	79	86	90			5					87	883
William Lloyd Garrison				129	136	165	152	155	185								189	1,111
Totals	1,469	7,454	7,877	8,699	8,982	9,611	10,095	10,749	11,667	214	683	349	669	59	838	79	7,594	87,088

ELEMENTARY SCHOOL PUPILS NOT PROMOTED.

June 30, 1922.

District.	Grade IX.	Grade VIII.	Grade VII.	Grade VI.	Grade V	Grade IV.	Grade III.	Grade II.	Grade I.	Ungraded.	Special English Class.	Special Class.	Open-Air Class.	Prevocational Class.	Conservation of Eyesight Class.	Kindergartens.	Total
Abraham Lincoln	9	11	10	9	24	28	24	15	36	.....	16	26	11	.....	.....	17	236
Agassiz	.....	7	17	4	20	16	.....	4	8	.....	.....	15	.....	13	.....	5	109
Bennett	.....	8	19	14	15	11	7	13	51	.....	.....	.....	.....	.....	.....	.....	138
Bigelow	4	.....	.....	14	10	27	3	3	36	.....	.....	12	.....	.....	.....	4	113
Blackinton-John Cheverus	.....	6	14	36	22	22	18	16	42	.....	.....	30	.....	.....	1	38	245
Bowditch	.....	6	5	12	13	19	12	18	17	.....	.....	.....	3	.....	.....	8	113
Bowdoin	.....	1	2	3	1	.....	2	6	18	.....	.....	22	5	.....	.....	28	88
Chapman	.....	5	7	15	17	19	29	13	33	.....	.....	9	.....	.....	.....	7	154
Charles Sumner	.....	3	11	9	10	8	7	7	8	.....	.....	.....	.....	.....	.....	10	73
Christopher Gibson	.....	9	2	4	3	13	11	7	9	.....	.....	.....	.....	.....	.....	3	61
Dearborn	.....	11	49	39	42	44	15	32	41	.....	16	.....	.....	7	.....	20	316
Dillaway	.....	2	14	7	10	10	2	5	24	.....	.....	24	.....	.....	.....	20	118
Dudley	.....	.....	22	40	35	39	19	15	26	.....	.....	13	.....	21	3	44	277
Dwight	.....	11	19	7	15	18	.....	4	19	5	.....	92	.....	.....	.....	9	199

Edmund P. Tileston			1	14	16	14	16	11	29							21	122
Edward Everett		4	16	4	15	7	14	20	31			13				2	126
Elihu Greenwood		11	6	10	10	8	7	12	26							23	113
Eliot		11	3	35	30	40	60	74	123	*37	38	33		4		3	491
Emerson	8	4	5	22	15	19	9	38	49							17	186
Everett		2	8	10	7	7	5	2	43			15				6	105
Francis Parkman			2	5	10	10	3	5	7							15	57
Franklin		5	9	7	6	12	9	8	34			10				16	116
Frederic W. Lincoln		18	15	21	20	33	7	10	11							17	152
Gaston	1		2	9	7	14	5	14	24								76
George Putnam	10	3	16	13	9	2	9	12	18			15				2	109
Gilbert Stuart		8	16	17	4	12	7	4	25							24	117
Hancock	5	3	15	52	63	66	12	28	79			35	19	11		91	479
Harvard-Frothingham		1	7	11	23	9	9	13	39			42			1	42	197
Henry Grew		2	11	3	4	4	12	18	27							24	105
Henry L. Pierce	17	32	34	21	14	11	7	13	44							8	201
Hugh O'Brien		7	16	9	3	17	10	7	14			15				14	112
Hyde		7	13	11	7	6	9	8	28			6		20		33	148
Jefferson		3	6	12	11	16	17	21	32			9				31	158
John A. Andrew		3	36	51	33	39	21	28	34							9	254
John Marshall					9	4	7	11	25							4	60
John Winthrop	5	4	18	1	7	9	16	10	39		2	5				5	121

* Includes 6 pupils at Fort Strong School.

ELEMENTARY SCHOOL PUPILS NOT PROMOTED.

June 30, 1922. — Concluded.

District.	Grade IX.	Grade VIII.	Grade VII.	Grade VI	Grade V.	Grade IV.	Grade III.	Grade II.	Grade I.	Ungraded.	Special English Class.	Special Class.	Open-Air Class.	Prevocational Class.	Conservation of Eyesight Class.	Kindergartens.	Total.
Julia Ward Howe					12	11	9	11	30			11				1	85
Lawrence		3	5	8	9	4	10	13	24			9		2		7	94
Lewis	10		1	1	3	4	3	5	8							4	39
Longfellow		6	15	8	1	15	7	11	17			10				2	92
Lowell		2	10	3	17	14	12	10	37			26	3			11	145
Martin		3	12	13	7	9	3	4	10						1	20	82
Mary Hemenway	10	10	15	35	26	13	19	29	55							23	235
Mather		11	37	34	48	54	11	15	40			16		20		17	303
Minot		5		2	9	2		4	5								27
Norcross			1	15	14	22	1	7	30		3	16	5		2	8	124
Oliver Hazard Perry			14	35	17	14		3	19			9				2	113
Oliver Wendell Holmes	16	82	75														173
Phillips Brooks		4	54	13	4	8		5	10			11				22	131
Prescott		3	1	11	9	4	8	1	15			8		1		13	74
Prince		1	9	5	11	5	3	5	31							4	74

Quincy		3	3	6	9	9	2	7	58	12	17	22	5	13		31	197
Rice		2	2	15	9	2	5	16	21							4	76
Robert Gould Shaw	12	12	23	10	11	10	13	4	14								109
Roger Wolcott		38	32	44	32	54	16	25	37			14				21	313
Samuel Adams		7	4	11	23	18	16	13	143			13				53	301
Sherwin			1	7	5	12	10	10	23			133		7		5	213
Shurtleff		2	1	13	8	13	5	10	22							16	90
Theodore Lyman		2	1	9	14	9	13	31	49		21	20		7		20	196
Thomas Gardner		5	5	13	4	17	5	15	52			15				25	156
Thomas N. Hart		6	14	26	15	31	5	8	16			15				9	145
Ulysses S. Grant	3	6	4	14	23	17	19	26	25								137
Warren-Bunker Hill			10	12	18	8	4	19	54			33				29	187
Washington		14	13	13	12	21	15	43	102			16	3			8	260
Washington Allston		8	14	10	8	12	1	4	19							22	98
Wells		6	23	13	13	13	17	20	45		24	36	3		3	15	231
Wendell Phillips		8	9	5	10	30	7	6	15		21	78				10	199
William E. Endicott				21	10	17	12	32	67		30					26	215
William E. Russell		9	28	33	16	2	2	9	11			12				20	142
William Lloyd Garrison				7	7	11	4	10	8							11	58
Totals	110	466	882	1,016	994	1,118	677	956	2,261	54	188	964	57	126	11	1,079	10,959

GRADUATES, JUNE, 1922.

School or District.	Boys.	Girls.	Total.
Normal	.....	75	75
High and Latin.			
Public Latin	90	.....	90
Girls' Latin	.....	95	95
Brighton High	29	80	109
Charlestown High	14	28	42
Dorchester High	113	299	412
East Boston High	57	83	140
English High	407	.....	407
Girls' High	.....	369	369
High School of Commerce	229	.....	229
High School of Practical Arts	.....	68	68
Hyde Park High	59	76	135
Mechanic Arts High	134	.....	134
Roxbury High	.....	260	260
South Boston High	49	97	146
West Roxbury High	34	147	181
Totals	1,215	1,602	2,817
Elementary.			
Agassiz	*66	.....	66
Bennett	88	78	166
Blackinton-John Cheverus	88	59	147
Bowditch	.....	92	92
Bowdoin	.....	59	59
Chapman	48	71	119
Charles Sumner	51	58	109
Christopher Gibson	79	77	156
Dearborn	†38	55	93
Dillaway	.....	96	96
Dudley	‡73	.....	73
Dwight	68	.....	68
Edmund P. Tileston	39	46	85
Edward Everett	62	65	127
Elihu Greenwood	64	81	145
Eliot	§	.....	.....
Everett	.....	65	65
Francis Parkman	32	39	71
Franklin	‖3	57	60
Frederic W. Lincoln	55	.....	55
Gilbert Stuart	35	35	70
Harvard-Frothingham	66	47	113
Henry Grew	38	36	74
Hugh O'Brien	95	75	170
Hyde	.....	62	62
Jefferson	61	62	123
John A. Andrew	38	36	74
Lawrence	¶51	.....	51
Longfellow	72	61	133
Lowell	56	57	113
Martin	30	30	60
Mather	**105	101	206
Minot	36	32	68
Oliver Hazard Perry	38	35	73
Phillips Brooks	59	72	131
Prescott	††29	33	62
Prince	37	58	95

* Also 6 given pre-vocational diplomas.
† Also 32 given pre-vocational diplomas.
‡ Also 41 given pre-vocational diplomas.
§ 3 given pre-vocational diplomas.
‖ Graduated from conservation of eyesight class.
¶ Also 10 given pre-vocational diplomas.
** Also 50 given pre-vocational diplomas.
†† Also 26 given pre-vocational diplomas.

GRADUATES, JUNE, 1922.—*Concluded.*

School or District	Boys.	Girls.	Total.
Quincy	*55	.....	55
Rice	58	47	108
Samuel Adams	85	75	160
Sherwin	†35	.....	35
Shurtleff	.....	63	63
Theodore Lyman	†44	38	82
Thomas Gardner	51	49	100
Thomas N. Hart	102	.....	102
Warren-Bunker Hill	74	97	171
Washington	49	56	105
Washington Allston	60	71	131
Wells	.....	138	138
Wendell Phillips	177	.....	177
William E. Russell	52	57	109
Totals	2,542	2,521	5,063
Boston Clerical	.....	48	48
Horace Mann	7	5	12

Summary.			
Normal	.....	75	75
Boston Clerical	.....	48	48
High and Latin	1,215	1,602	2,817
Elementary	2,542	2,521	5,063
Horace Mann	7	5	12
Totals	3,764	4,251	‡8,015

* Also 26 given pre-vocational diplomas.

† Also 31 given pre-vocational diplomas.

‡ In addition, 256 were given pre-vocational diplomas in June and 154 were given regular diplomas in September after satisfactorily completing the work of the Summer Review Schools. (See page 34.) The net total number of graduates in 1922 was 8,425

SUMMER REVIEW SCHOOLS.

Graduates, September, 1922.

School or District.	Boys.	Girls.	Total.
Charlestown High		3	3
Dorchester High		1	1
English High	22		22
Girls' High		1	1
High School of Commerce	2		2
High School of Practical Arts		1	1
Hyde Park High	1		1
Mechanic Arts High	2		2
Roxbury High		6	6
South Boston High	2		2
West Roxbury High	2	1	3
Totals	31	13	44
Agassiz	4		4
Bennett	4	1	5
Blackinton-John Cheverus	1	1	2
Bowditch		4	4
Chapman		3	3
Charles Sumner	2		2
Dearborn	3	2	5
Dillaway		1	1
Dwight	1		1
Francis Parkman	1		1
Franklin		2	2
Frederic W. Lincoln	14		14
Gaston		1	1
Gilbert Stuart		2	2
Hancock		3	3
Henry Grew		2	2
Lawrence	2		2
Longfellow	2		2
Mather	1	2	3
Minot	1		1
Norcross		1	1
Phillips Brooks	3	3	6
Prescott		1	1
Prince	1		1
Roger Wolcott	1		1
Samuel Adams	1	4	5
Sherwin	2		2
Shurtleff		2	2
Thomas Gardner	1		1
Washington	6	7	13
Washington Allston	1		1
Wells		6	6
Wendell Phillips	8		8
William E. Russell	1	1	2
Totals	61	49	110

Summary.			
High	31	13	44
Elementary	61	49	110
Totals	92	62	154

SUMMER REVIEW ELEMENTARY SCHOOL PUPILS PROMOTED.

September, 1922.

Name of School.	Grade VIII.	Grade VII.	Grade VI.	Grade V.	Grade IV.	Special English Class.	Totals.
Bigelow	18	41	61	48	65	.....	233
Charlestown	8	46	41	59	57	.....	211
City	95	126	112	95	82	34	544
Dorchester	104	113	86	78	83	.....	464
East Boston	65	111	115	112	116	20	539
Hugh O'Brien	28	74	79	85	106	.....	372
Hyde Park	26	60	46	38	29	.....	199
Lewis	58	162	132	149	136	.....	637
Shurtleff	4	44	45	42	56	.....	191
West End	47	78	118	122	140	76	591
Totals	453	855	835	838	870	130	3,981

SUMMER REVIEW ELEMENTARY SCHOOL PUPILS NOT PROMOTED.

September, 1922.

Name of School.	Grade VIII.	Grade VII.	Grade VI.	Grade V.	Grade IV.	Special English Class.	Totals.
Bigelow	.....	5	20	12	17	.....	54
Charlestown	2	13	15	24	10	.....	64
City	16	53	57	59	54	16	255
Dorchester	12	32	11	15	16	.....	86
East Boston	2	6	8	15	13	8	52
Hugh O'Brien	5	14	7	10	14	.....	50
Hyde Park	9	16	17	14	8	.....	64
Lewis	8	28	42	19	24	.....	121
Shurtleff	1	13	8	3	5	.....	30
West End	3	11	13	20	31	6	84
Totals	58	191	198	191	192	30	860

Schools to Which Pupils Were Admitted.	Boys.	Girls.	Total.	Boston High School Graduates, June, 1921.	Received from Other Sources, September, 1921.	Average Age of High 1921 Graduates.		Average Age of All Admitted.	
						Years.	Months.	Years.	Months.
Normal	.....	107	107	87	20	17	10	17	11

Schools to Which Pupils Were Admitted.	Boys.	Girls.	Total.	Boston Elementary Graduates, June, 1921.	Received from Other Sources, September, 1921.	Average Age of Boston Elementary Graduates.		Average Age of All Admitted.	
						Years.	Months.	Years.	Months.
Public Latin	548	.....	548	239	* 309	14	1	13	8
Girls' Latin	.....	370	370	132	† 238	13	9	13	2
Brighton High	130	184	314	253	61	14	4	14	4
Charlestown High	175	209	384	241	143	14	6	14	4
Dorchester High	243	292	535	436	99	14	3	14	4
East Boston High	165	179	344	261	83	14	1	14	1
English High	750	.....	750	670	80	14	1	14	2
Girls' High	.....	637	637	520	117	14	2	14	2
High School of Commerce	588	.....	588	440	148	14	.....	14	.....
High School of Practical Arts	.....	391	391	314	77	14	1	14	3
Hyde Park High	182	170	352	254	98	14	2	14	4
Mechanic Arts High	590	.....	590	507	83	14	3	14	3
Roxbury High	.....	432	432	341	91	13	9	13	9
South Boston High	128	207	335	251	84	14	1	14	2
West Roxbury High	83	271	354	273	81	14	4	14	7
Totals, High and Latin	3,582	3,342	6,924	5,132	1,792	14	1	14	1

* Includes 121 pupils below eighth grade.

† Includes 118 pupils below eighth grade.

ADMISSIONS TO NINTH GRADE INTERMEDIATE CLASSES.

September, 1921.

Schools to Which Pupils Were Admitted.	Boys.	Girls.	Total.	Boston Elementary Graduates, June, 1921.	Received from Other Sources, September, 1921.	Average Age of Boston Elementary Graduates.		Average Age of All Admitted.	
						Years.	Months.	Years.	Months.
Abraham Lincoln	50	86	136	116	20	13	1	13	2
Bigelow	76	.....	76	76	.....	13	5	13	5
Emerson	48	48	96	96	.....	14	.....	14	.....
Gaston	.....	73	73	73	.....	14	1	14	1
George Putnam	56	92	148	145	3	13	8	13	8
Hancock	.....	73	73	72	1	14	5	14	5
Henry L. Pierce	42	66	108	107	1	14	.....	14	1
John Winthrop	47	63	110	109	1	14	4	14	3
Lewis	108	133	241	237	4	13	8	13	8
Mary Hemenway	62	101	163	159	4	14	.....	14	.....
Oliver Wendell Holmes	130	154	284	273	11	14	2	14	2
Robert Gould Shaw	34	61	95	93	2	14	4	14	5
Ulysses S. Grant	46	42	88	88	.....	12	1	12	1
Totals	699	992	1,691	1,644	47	13	10	13	10

TEACHERS.

SUMMARY OF ALL TEACHERS — JUNE 30, 1922.

Number of Schools.

Schools.	Number of Schools.	Number of Teachers.		
		Men.	Women.	Total.
Normal	1	4	15	19
High and Latin	15	305	304	609
Elementary	* 70	145	2,099	2,244
Kindergarten	† 166	....	304	304
Special	‡ 5	116	309	425
Totals	257	570	3,031	3,601

* Represents the number of districts.

† Includes nineteen afternoon classes as follows: George Putnam (1); Hancock (3); Hugh O'Brien (1); Mather (1); Phillips Brooks (1); Quincy (1); Roger Wolcott (2); Samuel Adams (3); Shurtleff (1); Theodore Lyman (2); Ulysses S. Grant (1); William E. Endicott (1); William Lloyd Garrison (1).

‡ Horace Mann School, Boston Clerical School, Boston Disciplinary Day School, Boston Trade School and Trade School for Girls. The number of teachers given includes the teachers of the special schools and all general supervisors and directors.

NORMAL SCHOOL TEACHERS.

June 30, 1922.

Rank.	Men.	Women.	Total.
Head Master	1	.....	1
Masters, Heads of Departments	* 3	.....	3
First Assistants, Heads of Departments	.....	6	6
Assistants	.....	6	6
Instructor	.....	1	1
Temporarily assigned for school year	.....	2	2
Totals	4	15	19

* Excludes one master, head of department, who is assigned principal of the Model School.

SUMMARY OF HIGH AND LATIN SCHOOL TEACHERS.

June 30, 1922.

Rank.	Men.	Women.	Total.
Head Masters	15	.....	15
Masters, Heads of Departments	53	.....	53
First Assistants, Heads of Departments	.....	31	31
Masters	22	.....	22
Junior Masters	176	.....	176
Assistants	1	204	205
Industrial Instructor, Head of Department	.....	1	1
Instructors in Special Branches	15	12	27
Assistant Instructors in Special Branches	.....	36	36
Co-ordinators	2	.....	2
Co-operative Instructors	10	.....	10
Industrial Instructors	.....	13	13
Junior Assistants	8	6	14
Temporarily assigned for the school year	3	1	4
Totals	305	304	609

HIGH AND LATIN SCHOOLS.

Number and Rank of Teachers, June 30, 1922.

Schools.	Head Masters.	Masters, Heads of Departments.	First Assistants, Heads of Departments.	Masters.	Junior Masters.	Assistants.	Industrial Instructor, Head of Department.	Instructors in Special Branches.	Assistant Instructors in Special Branches.	Co-ordinators.	Co-operative Instructors.	Industrial Instructors.	Junior Assistants.	Temporarily Assigned for the School Year.	Totals.
Public Latin	1	6	....	6	21	....	.....	....	....	....	....	....	....	....	34
Girls' Latin	1	2	3	....	2	19	.....	2	....	....	....	....	....	....	29
Brighton High	1	1	1	....	*2	10	.....	1	3	....	1	....	....	1	21
Charlestown High	1	2	1	....	3	†6	.....	1	....	1	4	....	1	....	20
Dorchester High	1	3	4	4	12	33	.....	1	6	....	2	3	3	1	73
East Boston High	1	1	3	....	4	12	.....	2	3	....	1	....	....	....	27
English High	1	7	....	7	48	....	.....	2	....	....	....	....	2	....	67
Girls' High	1	3	4	....	6	†45	.....	1	5	....	....	....	....	....	65
High School of Commerce	1	7	....	1	‡34	1	.....	4	....	....	....	....	1	....	49
High School of Practical Arts	1	2	3	....	1	14	1	1	3	....	....	§9	2	....	37
Hyde Park High	1	3	1	....	5	13	.....	2	....	1	2	§1	1	2	32
Mechanic Arts High	1	9	....	3	29	....	.....	5	....	....	....	....	3	....	50
Roxbury High	1	2	4	....	2	25	.....	1	8	....	....	....	1	....	44
South Boston High	1	2	3	1	4	14	.....	1	4	....	....	....	....	....	30
West Roxbury	1	3	4	....	3	13	.....	3	4	....	....	....	....	....	31
Totals	15	53	31	22	176	205	1	27	36	2	10	13	14	4	609

* Excludes one junior master assigned to Department of Manual Arts.

† Excludes one assistant assigned to the Normal School.

‡ Exclude one junior master assigned as commercial co-ordinator.

§ Excludes one industrial instructor assigned to Department of Household Science and Arts.

SUMMARY OF ELEMENTARY SCHOOL TEACHERS.

June 30, 1922.

Rank.	Men.	Women.	Total.
Masters	69	9	69
Submasters	82	.....	82
Masters' Assistants	.....	71	71
First Assistants, Grammar Schools	.....	19	19
First Assistant, Primary School	.....	1	1
First Assistants in Charge	.....	103	103
Prevocational Assistants	1	24	25
Instructors, Special Classes	.....	73	73
Other Assistants	2	1,792	1,794
Assigned Teachers	.....	5	5
Junior Assistants assigned from High Schools	.....	2	2
Totals	145	2,099	2,244
Kindergartens:			
First Assistants	.....	160	160
Assistants	.....	144	144
Totals	.....	304	304

ELEMENTARY SCHOOLS.

Number and Rank of Teachers June 30, 1922.

Schools.	Masters.	Submasters.	Masters' Assistants.	First Assistants, Grammar Schools.	First Assistant, Primary Schools.	First Assistants in Charge.	Prevocational Assistants.	Instructors, Special Classes.	Other Assistants.	Assigned Teachers.	Junior Assistants Assigned from High Schools.	Total Number of Grade Teachers, June 30, 1922.	Kindergartens.	
													First Assistants.	Assistants.
Abraham Lincoln	1	1	2	1	.....	2	.....	2	41	.....	.....	50	1	2
Agassiz	1	1	1	.....	.....	1	2	1	11	.....	.....	18	1	1
Bennett	1	1	1	.....	.....	3	.....	2	36	.....	.....	43	4	2
Bigelow	1	1	1	.....	.....	1	.....	1	16	.....	.....	21	1	1
Blackinton-John Cheverus	1	2	2	.....	.....	1	.....	2	29	.....	.....	37	4	2
Bowditch	1	.....	1	1	.....	2	.....	.....	22	.....	.....	27	2	2
Bowdoin	1	.....	1	1	.....	1	.....	1	16	.....	.....	21	2	2
Chapman	1	1	1	.....	.....	1	.....	.....	25	1	.....	30	2	2
Charles Sumner	1	2	1	1	.....	1	.....	.....	19	.....	.....	25	3	2
Christopher Gibson	1	1	1	.....	.....	1	.....	.....	21	.....	.....	25	1	1
Dearborn	1	2	1	1	.....	2	2	1	36	.....	.....	46	2	1
Dillaway	.....	2	.....	.....	.....	3	.....	1	21	.....	.....	27	2	2
Dudley	1	1	2	.....	.....	1	*3	1	18	2	.....	29	2	2
Dwight	1	1	1	.....	.....	1	.....	†5	14	.....	.....	23	1	1

Edmund P. Tileston	1		1			1			18			21	2	1
Edward Everett	1	1	1			2		1	33		1	40	2	2
Elihu Greenwood	1	2	1			1			26			31	4	2
Eliot	1	3	1			3	1	3	54			66	2	2
Emerson	1	1	1			2			27			32	2	2
Everett	1	1				1		1	16			20	1	1
Francis Parkman	1	1	1						15			18	2	2
Franklin	1		1			2		1	19			24	2	2
Frederic W. Lincoln	1	2	1			1			13			18	1	2
Gaston	1		1	1		1			22			26	1	1
George Putnam	1	1	1			1		2	30			36	2	1
Gilbert Stuart	1	1	1			1			15			19	2	1
Hancock	1		2			3		3	52			61	6	8
Harvard–Frothingham	1	2	1	1		2		1	19			27	3	3
Henry Grew	1	1	1						17			20	2	3
Henry L. Pierce	1	2	1	1		2		1	37			45	2	2
Hugh O'Brien	1	2	1		1	1		1	30			37	3	2
Hyde	1		1			2	1	1	12			18	2	2
Jefferson	1	1	2	1		1		1	26			33	3	3
John A. Andrew	1	1	1			1			21			25	1	1
John Marshall	1		1			1		1	27			31	2	3
John Winthrop	1	1	1	1		3		1	33			41	2	1

* Includes one first assistant in charge of prevocational classes.

† Includes one first assistant in charge of special classes.

ELEMENTARY SCHOOLS.

Number and Rank of Teachers June 30, 1922. — Concluded.

Schools.	Masters.	Submasters.	Masters' Assistants.	First Assistants, Grammar School.	First Assistant, Primary School.	First Assistants in Charge.	Prevocational Assistants.	Instructors, Special Classes.	Other Assistants.	Assigned Teachers.	Junior Assistants Assigned from High Schools.	Total Number of Grade Teachers, June 30, 1922.	Kindergartens.	
													First Assistants.	Assistants
Julia Ward Howe	1	1	1			1		1	22			27	1	1
Lawrence	1		1			2	2	1	14	1		22	1	
Lewis	1	2	1			1			33		1	39	2	2
Longfellow	1	1	1	1				1	27			32	2	1
Lowell	1	1	1			2		2	22			29	2	2
Martin	1	1	1			2			10			15	2	2
Mary Hemenway	1	2	1	1		2			44			51	3	3
Mather	1	2	1	1		2	*3	1	50			61	3	4
Minot	1		1			1			11			14	1	1
Norcross	1		1			2		1	22			27	2	2
Oliver Hazard Perry	1		1	1		1		1	16			21	1	1
Oliver Wendell Holmes	1	3	1			1			22			28		
Phillips Brooks	1	2	1			1		1	32			38	4	4
Prescott	1	1	1			1	2	1	12			19	1	1

Prince	1	1	1			1			21			25	1	1
Quincy	1	2	1			1	2	2	21			30	4	4
Rice	1	1	1			1			21			25	1	1
Robert Gould Shaw	1	1	1	1		3			28			35	2	1
Roger Wolcott	1	1	1	1		4		1	54			61	5	5
Samuel Adams	1	2	1	1		2		1	51			59	6	5
Sherwin	1	2	1			2	2	†9	11			28	1	
Shurtleff	1	1				1			18			21	1	1
Theodore Lyman	1	1	1			1	5	1	27			37	4	4
Thomas Gardner	1	2	1			1		1	30			36	3	3
Thomas N. Hart	1	1	1			2		1	20			26	2	2
Ulysses S. Grant	1	1	1	1		1			30			36	3	3
Warren-Bunker Hill	1	2	1			2		2	34			42	4	1
Washington	1	2	1			1		2	35			42	3	3
Washington Allston	1	1	1			1			24			28	2	1
Wells	1	1		1		3		3	36			45	4	3
Wendell Phillips	1	2	1			1		†5	25	1		36	1	1
William E. Endicott	1	1	1			2		1	46			52	5	6
William E. Russell	1	1	1			1		1	19			24	2	2
William Lloyd Garrison	1	1	1						19			22	4	3
Totals	69	82	71	19	1	103	25	73	1,794	5	2	2,244	160	144

* Includes one first assistant in charge of prevocational classes.

† Includes one first assistant in charge of special classes.

SPECIAL TEACHERS, SUPERVISORS AND DIRECTORS.

June 30, 1922.

	Men.	Women.	Total.
Boston Clerical School: *			
Head Instructor in Bookkeeping	1		1
Clerical Instructors	2		2
Clerical Assistants		5	5
Horace Mann School:			
Principal		1	1
Assistant Principal		1	1
Assistants		12	12
Assigned Teacher		1	1
Day Industrial Schools:			
Trade School for Girls:			
Master		1	1
Heads of Departments		7	7
Instructor in Personal and Shop Hygiene		1	1
Vocational Assistants		3	3
Trade Assistants		19	19
Helpers		2	2
Boston Trade School:			
Master	1		1
Vice Principal	1		1
Division Heads	5		5
Senior Instructors	6		6
Shop Foremen	6		6
Shop Instructors	2		2
Instructor	1		1
Household Science and Arts:			
Director		1	1
Teachers, assigned to Director from a high school		2	2
Cookery		43	† 43
Sewing		65	‡ 65
Department of Manual Arts:			
Director	1		1
Associate Director	1		1
Assistant Directors	3		3
Acting Assistant Director (assigned)	1		1
First Assistants		2	2
Assistants		8	8
Foremen, Shopwork	4	1	5
Shop Foremen	8		§ 8
Instructors, Shopwork	8	1	9
Shop Instructors	18		‖ 18
Instructors in Manual Training		12	12
Assistant Instructors in Manual Training		36	36
Assigned Teacher		1	1
Music Department:			
Director	1		1
Assistant Directors	4		4
Assistants		9	9
Assigned Teacher		1	1
Practice and Training:			
First Assistant Director		1	1
Assistant Directors		3	3
Primary Supervisors		2	2
Master's Assistant Assigned		1	1
Director of Evening Schools	1		1

* The head master of the Roxbury High School served also as the head master of the Boston Clerical School. He is counted in the number of high and Latin school teachers.

† Includes one temporary teacher in place of teacher assigned to Hyde Park High School.

‡ Includes one temporary teacher in place of a teacher assigned to the Continuation School.

§ Includes two temporary teachers in place of two shop foremen assigned to Brighton High School and Hyde Park High School respectively.

‖ Includes one temporary teacher in place of a shop instructor assigned to Dorchester High School.

SPECIAL TEACHERS, SUPERVISORS AND DIRECTORS.

June 30, 1922.— Concluded.

	Men.	Women.	Total.
Continuation School:			
Principal	1		1
Heads of Divisions	2	1	3
Division Foremen	3		3
Shop Foremen	2		2
Shop Instructors	3		3
Instructors, Boys' Classes	12		12
Vocational Assistant		1	1
Trade Assistants		5	5
Instructors	5		5
Assistants		18	18
Assigned Sewing Teacher		1	1
Department of Educational Investigation and Measurement:			
Assistant Director	1		1
Research Assistant		1	1
Chief Examiner	1		1
Director of Kindergartens		1	1
Assistant Director of Kindergartens		1	1
Director of Special Classes		1	1
Acting Commercial Co-ordinator (junior master assigned from a high school)	1		1
Boston Disciplinary Day School		3	3
Day School for Immigrants		3	*3
Speech Improvement Classes:			
Assistant in Charge		1	1
Assistants		9	9
Assigned Teacher		1	1
Temporary Teacher		1	1
Conservation of Eyesight Classes		8	**8
Director of Penmanship		1	1
Examiner of Penmanship		1	1
Director of Medical Inspection	1		1
Physical Training:			
Director	1		1
Supervisor in Charge of Playgrounds		1	1
Instructors in Physical Training	2		2
Instructors in Military Drill	4		4
Vocational Guidance:			
Director		1	1
Vocational Instructors	2		2
Vocational Assistants		5	5
Temporary Vocational Assistants		2	2
Totals	116	309	425

* Includes one assistant assigned from an elementary district. In addition there were twelve special assistants.

** Includes one temporary teacher and two assistants assigned from elementary districts.

MISCELLANEOUS SUPERVISORS.

Nurses (including supervising nurse)	52
School Physicians	48
Attendance Officers (including chief attendance officer)	29
Supervisor of Licensed Minors	1
Medical Inspector of Special Classes	1
Director of Extended Use of Public Schools	1

NUMBER OF TEACHERS.

January 31, 1922.

1.	Normal School		[1] 19
2.	Latin and Day High Schools		[2] 664
3.	Elementary Schools:		
	Principals	70	
	Grade Teachers	[3] 2,162	
			2,232
4	Kindergartens		[4] 306
5.	Boston Clerical School		11
6.	Horace Mann School		13
7.	Special Teachers:		
	Department of Household Science and Arts: Director, Assistant Director and two Industrial Instructors assigned from high schools		4
	Cookery		[5] 44
	Sewing		[6] 65
	Department of Manual Arts		[7] 122
	Department of Music		[8] 15
	First Assistant Director, Assistant Directors, and one teacher assigned, Department of Practice and Training		5
	Primary Supervisors		2
	Director of Evening Schools		1
	Assistant Director and Research Assistant, Department of Educational Investigation and Measurement		2
	Chief Examiner		1
	Director and Assistant Director of Kindergartens		2
	Director of Special Classes		1
	Medical Inspector		1
	Department of Vocational Guidance		[9] 10
	Speech Improvement Classes		[10] 12
	Conservation of Eyesight Classes		[11] 7
	Director of Penmanship		1
	Examiner of Penmanship		1
	Commercial Co-ordinator		[12] 1
	Director of Medical Inspection		1
	Director of Physical Training		1
	Instructors in Physical Training		2
	Instructors in Military Drill		4
	Supervisor in Charge of Playgrounds		1
	Director of Extended Use of Public Schools		1
8.	Day Industrial Schools:		
	Boston Trade School		[13] 30
	Trade School for Girls		[14] 50
9.	Continuation School		[15] 61
10.	Boston Disciplinary Day School		3
11.	Day School for Immigrants		[16] 39

[1] Excludes one master, head of department, acting master of the Model School, and includes two assistants assigned from high schools.

[2] Excludes one junior master assigned to Department of Manual Arts, two assistants assigned to Normal School, two industrial instructors assigned to Department of Household Science and Arts and one junior master assigned as commercial co-ordinator.

[3] Includes one assistant kindergarten assigned to Grades I and II; eight temporary teachers in place of: one assistant assigned to Day School for Immigrants, one master's assistant assigned to Department of Practice and Training, two assistants assigned to speech improvement classes, two assistants assigned to conservation of eyesight classes, one prevocational assistant assigned to Department of Manual Arts, and one assistant assigned to Department of Music.

[4] Includes one temporary teacher in place of assistant, kindergarten assigned to Grades I and II.

[5] Includes one temporary teacher in place of teacher assigned to high school. In addition there were three temporary teachers.

[6] Includes one temporary teacher in place of teacher assigned to Continuation School. In addition there were ten temporary teachers.

[7] Includes one junior master assigned from a high school, one prevocational assistant assigned from an elementary school and eleven temporary teachers.

[8] Includes one assistant assigned from an elementary school and one temporary assistant director.

[9] Includes two temporary vocational assistants.

[10] Includes one temporary teacher and two assistants assigned from elementary schools.

[11] Includes one temporary teacher and two assistants assigned from elementary schools.

[12] Junior master assigned from High School of Commerce.

[13] Includes ten temporary teachers.

[14] Includes five student aids and four temporary teachers.

[15] Includes five temporary teachers, one special assistant, one aid, and one teacher assigned from Department of Household Science and Arts.

[16] Includes one assistant assigned from an elementary school and thirty-six special assistants.

EVENING SCHOOLS.

Summary of Statistics — School Year 1921–22.

	Number of Schools.	Number of Regular Teachers.	Total Registration.			Average Number Belonging.	Average Attendance.	Average Absence.	Per Cent of Attendance.
			Males.	Females.	Total.				
High Schools	9	123	2,407	2,564	4,971	2,919	2,388	531	82
Elementary Schools	14	243	4,526	4,997	9,523	4,895	3,861	1,034	79
Boston Trade School, *	1	31	815	.....	815	457	352	105	77
Totals	24	397	7,748	7,561	15,309	8,271	6,601	1,670	80

* Includes four branches.

EVENING SCHOOLS.

School Year 1921–22.—Continued.

High Schools.	Total Registration.			Average Number Belonging.	Average Attendance.	Average Absence.	Per Cent of Attendance.	Number of Nights.
	Males.	Females.	Total.					
Brighton	114	133	247	129	100	29	78	75
Central	700	115	815	479	416	63	87	75
Charlestown	146	163	309	200	165	35	83	75
Dorchester	425	433	858	429	340	89	79	75
East Boston	196	162	358	222	185	37	83	75
Girls'	.....	608	608	360	290	70	81	75
Hyde Park	62	80	142	77	61	16	79	75
Roxbury	472	589	1,061	608	475	133	78	75
South Boston	292	281	573	415	356	59	86	75
Totals	2,407	2,564	4,971	2,919	2,388	531	82	75

EVENING SCHOOLS.

School Year 1921–22.— Concluded.

Elementary Schools.	Total Registration.			Average Number Belonging.	Average Attendance.	Average Absence.	Per Cent of Attendance.	Number of Nights.
	Males.	Females.	Total.					
Bigelow	392	368	760	373	298	75	80	75
Bowdoin	.....	378	378	209	157	52	75	75
Charles Sumner	62	451	513	223	164	59	74	75
Comins	282	524	806	399	308	91	77	75
Dearborn	191	201	392	228	183	45	80	75
Eliot	675	182	857	460	376	84	82	75
Franklin	713	520	1,233	632	514	118	81	75
George Putnam	99	414	513	211	174	37	82	75
Hyde Park	119	198	317	140	111	29	79	75
Phillips Brooks	348	638	986	495	387	108	78	75
Quincy	299	117	416	232	189	43	81	75
Roger Wolcott	105	247	352	191	148	43	77	75
Theodore Lyman	580	442	1,022	550	425	125	77	75
Washington	661	317	978	552	427	125	77	75
Totals	4,526	4,997	9,523	4,895	3,861	1,034	79	75
Trade Schools (Evening Classes).								
Boston Trade	511	.....	511	258	195	63	76	70
Brighton Branch	38	.....	38	30	24	6	80	35
Central Branch	111	.....	111	73	60	13	82	35
East Boston Branch	64	.....	64	38	28	10	74	70
Hyde Park Branch	91	.....	91	58	45	13	78	70
Totals	815	.....	815	457	352	105	77	70

CLASSIFICATION AND AGES OF PUPILS IN EVENING SCHOOLS, MARCH, 1922.

High Schools.

Subjects.	14 Years.		15 Years.		16 Years.		17 Years.		18 Years.		19 Years.		20 Years.		Over 21 and Under 25 Years.		Over 25 and Under 35 Years.		35 Years and over		Totals for Each Grade or Subject.		
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Total.
Commercial Subjects *....	62	60	181	231	456	506	408	465	328	367	190	190	130	112	246	274	161	190	47	54	2,209	2,449	4,658
Other Subjects †.....	3	1	4	2	27	5	30	18	18	11	21	9	16	6	33	26	35	23	11	14	198	115	313
Totals.....	65	61	185	233	483	511	438	483	346	378	211	199	146	118	279	300	196	213	58	68	2,407	2,564	4,971
Total number of pupils of each age.....	126		418		994		921		724		410		264		579		409		126				

* Including all subjects offered in Evening Commercial High Schools. † These subjects not offered in Evening Commercial High Schools.

(Ages as of September 1, 1921.)

CLASSIFICATION AND AGES OF PUPILS IN EVENING SCHOOLS, MARCH, 1922.—*Continued.*

Elementary Schools.

Grades.	14 Years.		15 Years.		16 Years.		17 Years.		18 Years.		19 Years.		20 Years.		Over 21 and Under 25 Years.		Over 25 and Under 35 Years.		35 Years and Over.		Totals for Each Grade or Subject.		
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Total.
Graduating	17	17	56	33	90	37	45	36	31	22	14	21	15	15	68	29	67	30	20	9	423	249	672
Subgraduating	4	4	11	9	15	7	8	14	5	7	12	6	6	8	70	25	59	16	24	13	214	109	323
Elementary	1	1	3	2	7	4	5	1	6	4	4	3	5	2	7	8	9	5	2	7	49	37	86
Lip Reading						1	1				1					1	4	5	15	36	21	43	64
Speech Improvement									1		1		1	1			4	2	2	3	9	6	15
Advanced Citizenship															4		9		10		23		23
Advanced					20	15	20	13	29	9	18	10	20	6	112	43	139	37	42	36	400	169	569
Intermediate			1	8	28	24	39	29	55	39	53	32	50	32	230	92	298	67	107	57	861	380	1,241
Beginners			8	2	115	106	181	154	239	175	247	153	197	109	671	302	600	180	254	140	2,515	1,321	3,836
Ungraded						2		3		1		1			3		5	3	3	17	11	27	38
Cooking						3		2		1				1		32		14		7		60	60
Dressmaking				1		36		37		60		58		55		273		351		224		1,095	1,095
Embroidery						8		4		11		5		24		35		37		11		135	135
Home Nursing												2				12		24		20		58	58
Millinery				1		20		24		29		45		78		307		489		315		1,308	1,308
Totals	22	22	79	56	275	263	299	317	366	358	350	336	294	331	1,168	1,159	1,194	1,260	479	895	4,526	4,997	9,523
Total number of pupils each age	44		135		538		616		724		686		625		2,327		2,454		1,374				

(Ages as of September 1, 1921.)

Trade Schools.

Subjects.	16 Years.		17 Years.		18 Years.		19 Years.		20 Years.		Over 21 and Under 25 Years.		Over 25 and Under 35 Years.		35 Years and Over.		Totals for Each Grade or Subject.		
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Total.
Shopwork	43	....	55	....	54	....	42	....	34	....	63	.....	72	.....	49	.....	412	.....	412
Drawing	23	....	42	....	33	....	24	....	23	....	39	.....	47	.....	15	.....	246	.....	246
Theory	21	....	19	....	24	....	14	....	19	....	24	.....	19	.....	17	.....	157	.....	157
Totals	87	....	116	....	111	....	80	....	76	....	126	.....	138	.....	81	.....	815	.....	815
Total number of pupils of each age	87		116		111		80		76		126		138		81				

(Ages as of September 1, 1921.)

CLASSIFICATION AND AGES OF PUPILS IN EVENING SCHOOLS, MARCH, 1922.—*Concluded.*

Grand Total.

	14 Years.		15 Years.		16 Years.		17 Years.		18 Years.		19 Years.		20 Years.		Over 21 and under 25 Years.		Over 25 and under 35 Years.		35 Years and over.		Totals for Each Grade or Subject.		
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Total.
High Schools	65	61	185	233	483	511	438	483	346	378	211	199	146	118	279	300	196	213	58	68	2,407	2,564	4,971
Elementary Schools	25	25	76	53	275	263	299	317	366	358	350	336	294	331	1,168	1,159	1,194	1,260	479	895	4,526	4,997	9,523
Trade Schools	....	....	....	....	87	....	116	....	111	....	80	....	76	....	126	.....	138	.....	81	.....	815	.....	815
Totals	90	86	261	286	845	774	853	800	823	736	641	535	516	449	1,573	1,459	1,528	1,473	618	963	7,748	7,561	15,309
Total number of pupils of each age	176		547		1,619		1,653		1,559		1,176		965		3,032		3,001		1,581				

(Ages as of September 1. 1921).

*Non-English Speaking Pupils.**

	15 Years.		16 Years.		17 Years.		18 Years.		19 Years.		20 Years.		21 Years and over.		Totals for Each Group.		
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Total.
Illiterates between 16 and 21 years of age	9	10	163	147	240	199	323	224	318	196	267	147	.....	.....	1,320	923	2,243
Illiterates over 21 years of age	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,490	974	2,490	974	3,464
Total number of pupils of each age	19		310		439		547		514		414		3,464		3,810	1,897	5,707

* Also reported under "Grades," Elementary Schools, page 52.
(Ages as of September 1, 1921.)

Countries of Birth of Pupils in Evening Schools.

Countries of Birth.	High Schools.	Elementary Schools.	Trade Schools.
Austria Hungary*	16	107	2
Belgium	6	27	2
British Possessions†	470	585	87
China	2	12	.....
Denmark	1	8	1
France	12	20	3
Germany‡	17	94	.....
Greece	19	273	1
Italy	114	2,240	33
Japan	4	3	.....
Mexico	.....	.....	.....
Netherlands	14	26	4
Norway	7	36	2
Portugal	1	115	.....
Roumania	3	49	.....
Russia§	340	2,003	51
Spain	1	23	.....
Sweden	15	96	10
Switzerland	2	5	.....
Turkey‖	49	495	3
United States	3,866	3,157	614
African Countries	4	5	.....
South American Countries	7	6	1
Other North American Countries	.....	105	.....
Other European Countries	.....	23	1
Other Asiatic Countries	1	10	.....
Totals	4,971	9,523	815

* Includes Austrians, Bohemians, Galicians and Hungarians.
† " Australians, Canadians, English, Irish, Newfoundlanders, Scotch and Welsh.
‡ " Germans, Hebrews, Poles.
§ " Finns, Hebrews, Lithuanians and Poles.
‖ " Albanians, Armenians, Syrians and Turks.

EVENING SCHOOLS.

School Year 1921–22.— Extension of Term.

Schools.	Total Registration.			Average Number Belonging.	Average Attendance.	Average Absence.	Per Cent of Attendance.	Number of Nights.
	Males.	Females.	Total.					
Bigelow	163	48	211	144	106	38	74	15
Dearborn	81	57	138	123	102	21	83	15
Eliot	111	39	150	122	97	25	80	15
Franklin	207	137	344	248	204	44	82	15
Phillips Brooks	138	164	302	234	181	53	77	15
Quincy	62	39	101	83	68	15	82	15
Theodore Lyman	83	29	112	90	67	23	74	15
Washington	135	155	290	236	170	66	72	15
Totals	980	668	1,648	1,280	995	285	78	15

DAY SCHOOL FOR IMMIGRANTS.

School Year 1921–22.

Number of Regular Teachers.	Total Registration.			Average Number Belonging.	Average Attendance.	Average Absence.	Per Cent of Attendance.
	Males.	Females.	Total.				
3*	542	980	1,522	794	633	161	80

* Not including special assistants.

DAY SCHOOL FOR IMMIGRANTS.

Summer Classes 1922.

Total Registration.			Average Number Belonging.	Average Attendance	Average Absence.	Per Cent of Attendance.
Males.	Females.	Total.				
65	70	135	103	94	9	91

DAY PRACTICAL ARTS CLASSES.

School Year 1921–22.

School.	Total Registration.	Average Number Belonging.	Average Attendance.	Average Absence.	Per Cent of Attendance.	Number of Sessions.
	Females.					
Francis Parkman	76	53	42	11	79	121
Frederic W. Lincoln	27	17	13	4	76	77
Hugh O'Brien	25	18	13	5	72	11
Longfellow	41	33	27	6	82	71
Mary Hemenway	93	63	50	13	79	70
Richard Olney	15	11	11	.....	100	2
Robert Gould Shaw	94	50	37	13	74	154
Shurtleff	32	18	14	4	78	21
Walnut Street	33	24	16	8	67	25
Totals	436	287	223	64	78	552

CONTINUATION SCHOOL.

School Year 1921–22.

Classes.	Number of Regular Teachers.	Total Registration.			Average Number Belonging.	Average Attendance.	Average Absence.	Per Cent of Attendance.
		Males.	Females.	Total.				
Compulsory Classes	49.7	3,864	2,889	6,753	3,422	3,308	114	97

SUMMER REVIEW SCHOOLS.

1922.

Name of School.	Total Registration.	Average Membership.	Average Attendance.	Percentage of Attendance.	Average Daily Number of Teachers.
High	786	724	685	94.6	31
Continuation	50	12	8	66.7	1
Elementary:					
Bigelow	287	267	264	98.9	9
Charlestown	316	276	253	91.7	8
City	799	724	698	96.0	23
Dorchester	648	592	583	98.4	20
East Boston	591	562	548	98.0	18
Hugh O'Brien	455	398	382	95.9	12
Hyde Park	263	242	228	94.0	8
Lewis	758	698	674	96.6	23
Shurtleff	221	208	203	97.6	7
West End	675	637	619	97.1	20
Totals:					
Elementary	5,013	4,604	4,452	96.7	148
Continuation	50	12	8	66.7	1
High	786	724	685	94.6	31
Totals, High, Elementary and Continuation	5,849	5,340	5,145	96.3	180

SUMMER PRACTICAL ARTS CLASSES (CANNING).

School Year 1921–22.

Number of Classes.	Total Registration.	Average Number Belonging.	Average Attendance.	Average Absence.	Per Cent of Attendance.
	Females.				
2	51	42	33	9	79

PLAYGROUNDS.

Number of Teachers School Year 1921–22.

Seasons.	First Assistants.	Assistants.	Sand Garden Assistants.	Supervisors.	Play Teachers.	Totals.
1921.						
Fall (September 12 to November 1, 1921):						
Men	.....	.....	.....	1	.....	1
Women	30	14	7	5	.....	56
Totals	30	14	7	6	.....	57
1922.						
Spring (April 20 to June 24, 1922):						
Men	.....	.....	.....	4	69	73
Women	42	39	17	5	5	108
Totals	42	39	17	9	74	181
Summer (June 26 to July 31, 1922):						
Men	.....	.....	.....	1	.....	1
Women	78	46	35	5	.....	164
Totals	78	46	35	6	.....	165
Summer (August 1 to September 9, 1922):						
Men	.....	.....	.....	1	.....	1
Women	80	26	63	5	.....	174
Totals	80	26	63	6	.....	175

SCHOOLHOUSE SUMMARY.

School Year Ending June 30, 1922.

Grade of School.	Number of Buildings.	Number of Portables (Wood).	Assembly Halls.	Drill Halls and Gymnasia.	Construction of Schoolhouses.	
					Wood.	Brick.
Normal	1	.....	1	1	.....	1
High and Latin	*16	14	15	14	.....	16
Elementary	241	199	78	.....	48	193
Boston Clerical School	1	.....	.....	.....	.....	1
Boston Trade School	1	1	1	.....	.....	1
Trade School for Girls	3	.....	1	.....	.....	3
Horace Mann	1	.....	.....	.....	.....	1
Continuation	1	2	.....	.....	.....	1
Totals	265	216	96	15	48	217

* Includes one elementary building (Patrick A. Collins Building) used exclusively as a high school.

Note: In addition to the above there were in use during the school year the following rented quarters: High schools, 1; elementary schools, 9; the Continuation School, 25 LaGrange street, with branches at 52 Tileston street and 2783 Tremont street, and Day School for Immigrants at 48 Boylston street. A class was also conducted at Fort Strong.

SCHOOLROOMS AND SITTINGS.

Schools.	Day Rooms.	Evening Rooms.	Day School Sittings.
Normal	22	.....	240
High and Latin (including all rooms in which instruction of any character is given)	592	123	20,819
Elementary	2,637	243	115,066
Horace Mann School	16	.....	215
Industrial Schools	48	31	1,333
Totals	3,315	397	137,673

CLASS ROOMS IN NORMAL, DAY HIGH AND LATIN SCHOOLS.

(Including Laboratories and all Other Rooms in which Instruction of any Character is Given.)

Schools.	Rooms.	Gymnasia and Drill Halls.
Normal	22	*G.
Public Latin School	36	†D. H. and G.
Girls' Latin School	25	*G.
Brighton High School	29	†D. H. and G.
Charlestown High School	23	G.
Dorchester High School	63	G.
East Boston High School	34	G.
English High School	‡39	†D. H. and G.
Girls' High School	52	G.
High School of Commerce	53	G.
High School of Practical Arts	††30	G.
Hyde Park High School	29	D. H.
Mechanic Arts High School	50	.....
Roxbury High School	**45	D. H.
South Boston High School	27	G.
West Roxbury High School	27	G.
Total	614	

* Used jointly. † Used jointly.

‡ Including Patrick A. Collins Schoolhouse and Franklin Union.

†† In addition nine rooms in adjacent house are used by practical arts classes.

** Including Sarah J. Baker and High School of Practical Arts Annexes and Boston Clerical School.

CLASS ROOMS IN DAY ELEMENTARY DISTRICTS.

(Including Regular Schoolhouses, Portables, Hired Quarters and Improvised Rooms in Halls, Corridors and Basements.)

June 30, 1922

District.	Class Rooms.	District.	Class Rooms.
Abraham Lincoln	53	Julia Ward Howe	27
Agassiz	22	Lawrence	33
Bennett	49	Lewis	37
Bigelow	34	Longfellow	32
Blackinton-John Cheverus	51	Lowell	33
Bowditch	27	Martin	35
Bowdoin	27	Mary Hemenway	63
Chapman	34	Mather	62
Charles Sumner	33	Minot	14
Christopher Gibson	25	Norcross	35
Dearborn	53	Oliver Hazard Perry	25
Dillaway	34	Oliver Wendell Holmes	33
Dudley	44	Phillips Brooks	39
Dwight	28	Prescott	24
Edmund P. Tileston	22	Prince	24
Edward Everett	42	Quincy	40
Elihu Greenwood	38	Rice	25
Eliot	74	Robert Gould Shaw	36
Emerson	42	Roger Wolcott	64
Everett	23	Samuel Adams	67
Francis Parkman	20	Sherwin	28
Franklin	34	Shurtleff	22
Frederic W. Lincoln	19	Theodore Lyman	35
Gaston	29	Thomas Gardner	37
George Putnam	36	Thomas N. Hart	29
Gilbert Stuart	31	Ulysses S. Grant	37
Hancock	76	Warren-Bunker Hill	58
Harvard-Frothingham	53	Washington	47
Henry Grew	22	Washington Allston	28
Henry L. Pierce	42	Wells	65
Hugh O'Brien	38	Wendell Phillips	43
Hyde	30	William E. Endicott	59
Jefferson	53	William E. Russell	32
John A. Andrew	30	William Lloyd Garrison	24
John Marshall	29		
John Winthrop	48	Total	2,637

SEATING CAPACITY.

NORMAL, LATIN AND DAY HIGH SCHOOLS.

(Seats Available for "Home" Seating.)

June 30, 1922.

Schools.	Regular Seats.	Hall Seats.	Portable Seats.	In Rented Quarters.	In Basements.	In Portable Buildings.	Totals.
Normal School	240	.....	.....	.....	.....	.....	240
Public Latin School	1,083	25	437	.....	.....	.....	1,545
Girls' Latin School	1,007	.....	51	.....	.....	.....	1,058
Brighton High School	710	160	43	.....	33	.....	946
Charlestown High School	540	.....	290	.....	.....	.....	830
Dorchester High School	1,625	96	477	.....	24	124	2,346
East Boston High School	807	.....	364	.....	.....	.....	1,171
English High School	2,105	70	64	600	42	.....	2,881
Girls' High School	2,055	.....	.....	.....	.....	.....	2,055
High School of Commerce	1,794	.....	.....	.....	.....	.....	1,794
High School of Practical Arts	415	.....	464	.....	.....	.....	879
Hyde Park High School	651	.....	.....	.....	.....	.....	651
Mechanic Arts High School	898	210	44	.....	.....	.....	*1,152
Roxbury High School	1,260	.....	84	.....	40	126	1,510
South Boston High School	795	.....	.....	.....	.....	143	938
West Roxbury High School	847	90	.....	.....	.....	126	1,063
Totals	16,832	651	2,318	600	139	519	21,059

* In addition, 7 shops, 3 laboratories, 1 drawing room and 1 chemical lecture room, accommodate 400 pupils.

SEATING CAPACITY OF DAY ELEMENTARY SCHOOLS.

June 30, 1922.

District.	Regular Seats.			Extra Seats.																		Total Number of Seats.		
				Portable seats in regular rooms.			Hall classes.			Basement.			Portable buildings.			Rented quarters.			Total number of extra seats.					
	Grades.	Kindergartens.	Total.	Grades.	Kindergartens.	Total.	Grades.	Kindergartens.	Total.	Grades.	Kindergartens.	Total.	Grades.	Kindergartens.	Total.	Grades.	Kindergartens.	Total.	Grades.	Kindergartens.	Total.	Grades.	Kindergartens.	Total.
Abraham Lincoln	2,130	125	2,255	21	....	21	31	....	31	....	....	....	....	....	....	....	34	34	52	34	86	2,182	159	2,341
Agassiz	881	50	931	....	....	....	....	....	....	....	....	....	46	....	46	....	....	....	46	....	46	927	50	977
Bennett	1,557	180	1,737	2	....	2	....	....	....	17	....	17	489	....	489	....	40	40	508	40	548	2,065	220	2,285
Bigelow	1,119	70	1,189	7	....	7	....	....	....	....	....	....	....	....	....	....	....	....	7	....	7	1,126	70	1,196
Blackinton-John Cheverus	1,650	187	1,837	56	....	56	....	....	....	....	....	....	84	....	84	....	....	....	140	....	140	1,790	187	1,977
Bowditch	1,115	100	1,215	41	....	41	....	....	....	....	....	....	86	....	86	....	....	....	127	....	127	1,242	100	1,342
Bowdoin	922	103	1,025	6	....	6	66	....	66	....	....	....	....	....	....	....	....	....	72	....	72	994	103	1,097
Chapman	1,108	104	1,212	10	....	10	....	....	....	....	....	....	260	....	260	....	....	....	270	....	270	1,378	104	1,482
Charles Sumner	1,192	150	1,342	8	....	8	....	....	....	....	....	....	44	....	44	....	....	....	52	....	52	1,244	150	1,394
Christopher Gibson	867	63	930	17	....	17	....	....	....	....	....	....	179	....	179	....	....	....	196	....	196	1,063	63	1,126
Dearborn	2,168	96	2,264	9	....	9	....	....	....	....	....	....	44	....	44	....	....	....	53	....	53	2,221	96	2,317
Dillaway	1,444	112	1,556	103	....	103	....	....	....	....	....	....	....	....	....	....	....	....	103	....	103	1,547	112	1,659
Dudley	1,407	132	1,539	63	....	63	....	....	....	....	....	....	....	....	....	....	....	....	63	....	63	1,470	132	1,602

SEATING CAPACITY OF DAY ELEMENTARY SCHOOLS.

June 30, 1922.—Continued.

District.	Regular Seats.			Extra Seats.																		Total Number of Seats.		
				Portable seats in regular rooms.			Hall classes.			Basement.			Portable buildings.			Rented quarters.			Total number of extra seats.					
	Grades.	Kindergartens.	Total.	Grades.	Kindergartens.	Total.	Grades.	Kindergartens.	Total.	Grades.	Kindergartens.	Total.	Grades.	Kindergartens.	Total.	Grades.	Kindergartens.	Total.	Grades.	Kindergartens.	Total.	Grades.	Kindergartens.	Total.
Dwight	923	116	1,039	88	....	88	....	....	....	....	....	....	....	....	....	....	....	....	88	....	88	1,011	116	1,127
Edmund P. Tileston	778	98	876	5	....	5	....	....	....	....	....	....	190	....	190	....	....	....	195	....	195	973	98	1,071
Edward Everett	1,787	121	1,908	1	....	1	24	....	24	....	....	....	89	....	89	....	....	....	114	....	114	1,901	121	2,022
Elihu Greenwood	1,219	162	1,381	31	....	31	....	....	....	....	....	....	305	....	305	....	....	....	336	....	336	1,555	162	1,717
Eliot	2,766	95	2,861	13	....	13	....	....	....	....	....	....	....	....	....	452	....	452	465	....	465	3,231	95	3,326
Emerson	1,376	113	1,489	24	....	24	....	....	....	....	....	....	174	....	174	....	....	....	198	....	198	1,574	113	1,687
Everett	907	56	963	22	....	22	....	....	....	....	....	....	....	....	....	....	....	....	22	....	22	929	56	985
Francis Parkman	760	50	810	....	....	....	....	....	....	27	....	27	86	....	86	50	50	100	163	50	213	923	100	1,023
Franklin	1,556	56	1,612	....	....	....	....	....	....	....	....	....	....	....	....	....	50	50	.....	*50	50	1,556	106	1,662
Frederic W. Lincoln	793	80	873	13	....	13	....	....	....	....	....	....	46	....	46	....	....	....	59	....	59	852	80	932
Gaston	1,223	50	1,273	16	....	16	18	....	18	....	....	....	2	....	2	....	....	....	36	....	36	1,259	50	1,309
George Putnam	981	73	1,054	3	....	3	45	....	45	....	....	....	520	....	520	....	....	....	568	....	568	1,549	73	1,622
Gilbert Stuart	1,165	100	1,265	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....	.....	.....	1,165	100	1,265
Hancock	2,309	222	2,531	19	....	19	....	....	....	....	....	....	....	....	....	360	....	360	379	....	379	2,688	222	2,910
Harvard-Frothingham	1,566	174	1,740	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....	.....	.....	1,566	174	1,740
Henry Grew	822	97	919	24	....	24	37	....	37	....	....	....	....	24	24	....	....	....	61	24	85	883	121	1,004
Henry L. Pierce	1,951	118	2,069	2	....	2	....	....	....	....	....	....	238	....	238	....	....	....	240	....	240	2,191	118	2,309

Hugh O'Brien	1,584	50	1,634										144	51	195				144	51	195	1,728	101	1,829
Hyde	1,121	120	1,241	15		15	24	23	47										39	23	62	1,160	143	1,303
Jefferson	1,537	165	1,702	14		14				20		20							34		34	1,571	165	1,736
John A. Andrew	1,155	67	1,222	5		5													5		5	1,160	67	1,227
John Marshall	1,190	140	1,330	19		19							183		183				202		202	1,392	140	1,532
John Winthrop	1,748	103	1,851	31		31							86		86				117		117	1,865	103	1,868
Julia Ward Howe	1,091	58	1,149	12		12							147		147				159		159	1,250	58	1,308
Lawrence	1,173	65	1,238	16		16													16		16	1,189	65	1,254
Lewis	1,110	107	1,217				80		80	129		129	513		513				722		722	1,832	107	1,939
Longfellow	1,428	90	1,518	2		2	40		40				184		184				226		226	1,654	90	1,744
Lowell	1,164	136	1,300	19		19							42		42				61		61	1,225	136	1,361
Martin	1,010	102	1,112	50		50													50		50	1,060	102	1,162
Mary Hemenway	2,139	161	2,300	4		4							265		265				269		269	2,408	161	2,569
Mather	2,365	155	2,520							96		96	348		348				444		444	2,809	155	2,964
Minot	580	45	625				35		35										35		35	615	45	660
Norcross	1,218	167	1,385	32		32													32		32	1,250	167	1,417
Oliver Hazard Perry	1,069	49	1,118										16		16				16		16	1,085	49	1,134
Oliver Wendell Holmes	1,233		1,233										34		34				34		34	1,267		1,267
Phillips Brooks	1,605	150	1,755				30		30				90		90				120		120	1,725	150	1,875
Prescott	779	59	838																			779	59	838
Prince	1,159	58	1,217																			1,159	58	1,217
Quincy	1,194	174	1,368	38		38													38		38	1,232	174	1,406
Rice	1,115	53	1,168	3		3													3		3	1,118	53	1,171
Robert Gould Shaw	1,334	128	1,462							57		57	169		169				226		226	1,560	128	1,688
Roger Wolcott	2,136	175	2,311	29		29				181		181	500		500				710		710	2,846	175	3,021
Samuel Adams	2,032	159	2,191	45		45				180		180	656		656				881		881	2,913	159	3,072

* Lincoln House (free).

SEATING CAPACITY OF DAY ELEMENTARY SCHOOLS.

June 30, 1922. — Concluded.

District.	Regular Seats.			Extra Seats.																	Total Number of Seats.		
				Portable seats in regular rooms.			Hall classes.			Basement.			Portable buildings.			Rented quarters.			Total number of extra seats.					
	Grades.	Kindergartens.	Total.	Grades.	Kindergartens.	Total.	Grades.	Kindergartens.	Total.	Grades.	Kindergartens.	Total.	Grades.	Kindergartens.	Total.	Grades.	Kindergartens.	Total.	Grades.	Kindergartens.	Total.	Grades.	Kindergartens.	Total.
Sherwin	708	50	758	116		116													116		116	824	50	874
Shurtleff	899	43	942	4		4							91		91				95		95	994	43	1,037
Theodore Lyman	1,237	81	1,321	23		23	40		40	45		45	314		314	42		42	464		464	1,701	84	1,785
Thomas Gardner	1,331	161	1,492										448		448				448		448	1,779	161	1,940
Thomas N. Hart	1,232	104	1,336	3		3							64		64				67		67	1,299	104	1,403
Ulysses S. Grant	1,511	100	1,611	12		12							202		202				214		214	1,725	100	1,825
Warren	2,064	200	2,264	6		6													6		6	2,070	200	2,270
Washington	1,775	150	1,925	10		10													10		10	1,785	150	1,935
Washington Allston	971	60	1,031	1		1							371		371		60	60	372	60	432	1,343	120	1,463
Wells	2,085	235	2,320	93		93													93		93	2,178	235	2,413
Wendell Phillips	1,570	47	1,617																			1,570	47	1,617
William E. Endicott	1,862	185	2,047	58		58				187	71	258	176		176				421	71	492	2,283	256	2,539
William E. Russell	1,396	110	1,506																			1,396	110	1,506
William Lloyd Garrison	921	247	1,168	31		31				50		50	42		42				123		123	1,044	247	1,291
Totals	95,273	7,765	103,038	1,295		1,295	470	23	493	989	71	1,060	7,967	75	8,042	904	234	1,138	11,625	403	12,028	106,898	8,168	115,066

EXTENDED USE OF PUBLIC SCHOOLS.

*SUMMARY OF STATISTICS — SEASON OF 1921–1922.

	School Centers.	Total Attendance.
1	School Center Activities:	
	(a) Forenoons	6,362
	(b) Afternoons	37,463
	(c) Evenings	431,223
	Total	475,048

	Non-School Centers.	Total Attendance.
2.	Non-School Center Activities:	
	(a) Forenoons	1,583
	(b) Afternoons	7,255
	(c) Evenings	49,813
	Total	58,651

	Additional Use of School Premises by Outside Groups.	Total Attendance.
3.	Additional Use of School Premises by Outside Groups:	
	(a) Forenoons	23,940
	(b) Afternoons	8,592
	(c) Evenings	154,204
	Total	186,736

Total Attendance — School Centers	475,048	
Total Attendance — Non-School Centers	58,651	
Total Attendance — Additional Use of School Premises by Outside Groups	186,736	
Grand Total	720,435	
1. Number of school centers maintained by the appropriation for the Extended Use of the Public Schools		9
2 Number of buildings occupied by non-school center groups at the expense of the appropriation for the Extended Use of the Public Schools		70
3. Number of buildings occupied by organizations paying light, heat, janitor and other service charges		77
Total		156

* Figures from May 15, 1921, to May 15, 1922.

SCHOOL CENTER ACTIVITIES (FORENOONS.)

DORCHESTER HIGH SCHOOL CENTER.

Activities.	Total Attendance.	Number of Sessions.	Average Attendance.
Dancing Class (children)	5,530	25	221
Dramatic Clubs (children)	832	23	36
Total	6,362		

SCHOOL CENTER ACTIVITIES (AFTERNOONS).

	Charlestown High School Center.			Dorchester High School Center.			East Boston High School Center.			Michael Angelo School Center.			Roxbury Practical Arts High School Center.		
	Total Attendance.	No. of Sessions.	Average Attendance.	Total Attendance.	No. of Sessions.	Average Attendance.	Total Attendance.	No. of Sessions.	Average Attendance.	Total Attendance.	No. of Sessions.	Average Attendance.	Total Attendance.	No. of Sessions.	Average Attendance.
Bazaars													400	1	400
Children's Parties	1,200	1	1,200	250	1	250									
Choral Clubs										80	2	40			
Committee Meetings and Conferences							349	25	14						
Concerts, Lectures and Entertainments	540	1	540							3,200	1	3,200			
Dancing Classes				750	1	750	4,289	27	159						
Dramatic Clubs													678	21	32
Family Welfare Society Meetings	98	13	8												
Girl Scout Troops				20	1	20							520	25	21
Gymnasium Games	63	7	9	150	1	150									
Home Nursing Clubs							37	4	9						
Mental Hygiene Courses							575	5	115						

Mothers' and Homemakers' Clubs	1,933	24	81	2,958	26	114	3,007	23	131				2,767	24	115
Motion Picture Programs	5,816	26	223				6,446	17	379	600	2	300			
Patriotic Mass Meetings				200	1	200									
Radio Clubs	65	10	7												
Rehearsals	343	3	114	150	1	150	240	10	24						
Travel Clubs							239	6	40						
Totals	10,058			4,478			15,182			3,380			4,365		

SCHOOL CENTER ACTIVITIES (EVENINGS.)

	Charlestown High School Center.			Dorchester High School Center.			East Boston High School Center.			English High School Center.			Michael Angelo School Center.			Roxbury Practical Arts High School Center.		
	Total Attendance.	No. of Sessions.	Average Attendance.	Total Attendance.	No. of Sessions.	Average Attendance.	Total Attendance.	No. of Sessions.	Average Attendance.	Total Attendance.	No. of Sessions.	Average Attendance.	Total Attendance.	No. of Sessions.	Average Attendance.	Total Attendance.	No. of Sessions.	Average Attendance.
A. A. R. I. R. Groups										4,290	16	269						
Aleppo Temple Groups										6,484	11	589						
Alumni and Alumnae Clubs	315	3	105	500	1	500				1,006	4	252				843	10	252
American Legion Posts	280	1	280	250	1	250												
American Legion, Women's Auxiliaries													248	5	50			
Auditorium Associates																640	7	91
Banquets				440	2	220	150	1	150									
Basketry Clubs							557	27	21									
Bazaars																750	2	375
Boy Scout Troops	811	31	26	685	11	62	30	2	15	10,598	86	123				1,507	53	26
Catholic Guilds	4,269	18	237															

Character Analysis Clubs	.....	.....	.....	.....	.....	.....	.....	.....	.....	828	22	38	.....	.....	.....	.....	.....	.....
Choral Clubs	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,843	72	26	2,793	75	37
Church Reunions	.....	.....	.....	8,200	4	2,050	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Committee Meetings and Conferences	49	5	10	45	3	15	197	18	11	.....	.....	.....	.....	.....	.....	876	56	16
Community Christmas Trees	.....	.....	.....	500	1	500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Community Meetings, Civic, Patriotic, etc	.....	.....	.....	1,100	6	183	4,475	8	559	.....	.....	.....	.....	.....	.....	3,014	14	215
Concerts, Lectures and Entertainments	637	3	212	4,900	11	441	6,640	16	415	3,055	25	122	11,375	27	421	30,778	80	385
Cooking, Dressmaking, Millinery and Sewing Clubs	.....	.....	.....	790	25	32	587	51	12	328	17	19	1,316	115	11	585	69	8
Dancing Classes	311	9	35	2,578	17	152	3,246	22	148	194	8	24	.....	.....	.....	1,922	12	12
Debating Clubs (young men and young women)	317	19	17	179	15	12	634	26	24	1,342	31	43	1,032	73	14	177	21	8
Dog Shows	.....	.....	.....	400	1	400	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dramatic Clubs	.....	.....	.....	.....	.....	.....	127	10	13	2,664	54	49	.....	.....	.....	2,299	138	17
Drawing Clubs	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	512	6	85
Friends of India Groups	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,485	13	345	.....	.....	.....	.....	.....	.....
Gaelic Clubs	.....	.....	.....	.....	.....	.....	.....	.....	.....	730	17	43	.....	.....	.....	.....	.....	.....
Girl Scout Troops	.....	.....	.....	1,094	15	70	632	31	20	1,004	15	67	.....	.....	.....	1,119	51	22
Gymnasium Games, Basketball, etc (young men)	5,684	24	237	4,988	19	263	1,135	20	57	33,831	246	141	.....	.....	.....	1,010	24	42
Gymnasium Games (young women)	242	7	35	730	24	30	.....	.....	.....	4,699	122	38	.....	.....	.....	1,073	33	33
Home Nursing Clubs	.....	.....	.....	25	1	25	15	2	8	.....	.....	.....	.....	.....	.....	44	4	11
Mothers' and Homemakers' Clubs	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	611	29	21

SCHOOL CENTER ACTIVITIES (EVENINGS).— *Concluded.*

	Charlestown High School Center.			Dorchester High School Center.			East Boston High School Center.			English High School Center.			Michael Angelo School Center.			Roxbury Practical Arts High School Center.		
	Total Attendance.	No. of Sessons.	Average Attendance.	Total Attendance	No. of Sessions.	Average Attendance.	Total Attendance.	No. of Sessions.	Average Attendance.	Total Attendance.	No. of Sessions.	Average Attendance.	Total Attendance.	No. of Sessions.	Average Attendance.	Total Attendance.	No. of Sessions.	Average Attendance.
Motion Picture Programs	8,696	42	207	11,714	27	433	24,141	43	561	4,973	12	414	11,550	24	439	7,150	21	340
Music Clubs (girls)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	74	7	11
Orchestra Clubs	.....	.....	.....	.....	.....	.....	659	29	23	.....	.....	.....	.....	.....	.....	665	20	33
Pageant Clubs	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	496	9	55
Parliamentary Law Clubs (women)	.....	.....	.....	98	13	7	.....	.....	.....	1,732	27	64	.....	.....	.....	.....	.....	.....
Radio Clubs	.....	.....	.....	147	13	11	323	15	22	.....	.....	.....	.....	.....	.....	.....	.....	.....
Red Cross Meetings	72	2	36	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rehearsals	.....	.....	.....	139	5	28	124	5	25	87	1	87	.....	.....	.....	318	29	11
Social and Dances	1,187	14	85	7,610	24	317	10,099	43	235	189	1	189	9,430	53	478	4,194	35	120
Taxpayers' League Meetings	.....	.....	.....	2,450	6	408	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Trade Union College Classes	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,610	62	26	.....	.....	.....	.....	.....	.....

Whist Clubs	2,692	29	93	1,440	35	41				308	3	103				896	14	64
Women's Clubs				62	5	12												
Young Men's Social Clubs										2,575	47	55				708	48	15
Young Women's Social Clubs	114	9	19				165	30	5	1,034	19	54	915	44	21	563	43	13
Young Men and Young Women's Social Clubs													176	8	22	902	21	43
Totals	25,676			51,064			53,936			88,046			37,885			66,519		

SCHOOL CENTER ACTIVITIES (EVENINGS).

	Sarah Greenwood School Center.			South Boston High School Center.			William Blackstone School Center.		
	Total Attendance.	No. of Sessions.	Average Attendance.	Total Attendance.	No. of Sessions.	Average Attendance.	Total Attendance.	No. of Sessions.	Average Attendance.
Alumni and Alumnæ Clubs				515	10	52			
American Legion, Women's Auxiliaries	400	3	133						
Boy Scout Troops	2,558	64	40	550	24	23	462	24	19
Catholic Guilds	2,214	18	123						
Choral Clubs	272	15	18	2,306	39	60			
Committee Meetings and Conferences							400	1	400
Community Meetings, Civic, Patriotic, etc.	1,225	5	245	300	1	300			
Concerts, Lectures and Entertainments	9,250	18	514	3,062	10	306	9,900	16	619
Cooking, Dressmaking, Millinery and Sewing Clubs,	597	42	14				164	8	21
Dancing Classes							2,478	29	85
Debating Clubs (Young Men)	196	23	9	171	17	10	325	18	18
Dramatic Clubs	250	13	19	297	10	30	1,681	44	36
Forums	1,900	7	271						
Girl Scout Troops				724	20	36			
Gymnasium Games, Basket Ball, etc. (Young Men)				10,435	44	237	1,904	46	41
Gymnasium Games (Young Women)				170	2	85			
Improvement Associations	972	8	190						
Jewish Welfare Center Groups	224	14	16						
Knights of Columbus Groups	132	8	17				300	1	300
Mothers' and Homemakers' Clubs	3,195	30	15				2,080	23	90
Motion Picture Programs	11,025	22	501	12,080	19	636	11,900	24	454
Orchestra Clubs	759	38	20						
Radio Clubs				177	11	16			
Red Cross Meetings	45	2	23						
Rehearsals							90	4	23
Socials and Dances				485	3	161	195	3	65
West End Tenants' League Meetings							1,000	3	333
Whist Clubs	115	2	58	90	1	90			

SCHOOL CENTER ACTIVITIES (EVENINGS).— *Concluded.*

	Sarah Greenwood School Center.			South Boston High School Center.			William Blackstone School Center.		
	Total Attendance.	No. of Sessions.	Average Attendance.	Total Attendance.	No. of Sessions.	Average Attendance.	Total Attendance.	No. of Sessions.	Average Attendance.
Women's Clubs							717	17	42
Young Men's Social Clubs	3,629	180	20	170	8	21			
Young Women's Social Clubs	2,034	104	11						
Young Men's and Young Women's Social Clubs	679	6	113						
Zionist Clubs	500	1	500				798	28	29
Totals	42,171			31,532			34,394		

NON–SCHOOL CENTER

Activities.	Normal School.	Girls' Latin School.	Public Latin School.	Brighton High School.
	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
Alumni and Alumnæ Meetings	202	205	80	
American Legion Meetings				
Basketball (Young Men)	150			
Basketball and Dramatics				500
Boy Scout Troops				200
Basketball and Boy Scout Troops				500
Civil Service Examinations				
Garden Teachers' Meetings	74			
Girl Scout Troops				
Gymnasium Games (Young Men)				1,855
Horticulture Courses	88			
Improvement Associations			225	
Memorial Day Exercises				
Prize Drills				425
Receptions, Dances, etc	1,200	300		650
Reunions, Banquets, etc	250			
Total Attendance	1,964	505	305	4,130

Activities.	High School of Practical Arts.	Roxbury High School.	South Boston High School.	West Roxbury High School.
	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
Alumni and Alumnæ Meetings				300
Americanization Meetings	100			
Boy Scout Troops				324
Civil Service Examinations		218		
Committee Meetings and Conferences	10			
Canning Schools	85			
Extension Courses				
Gymnasium Games (Young Men)				2,680
Parent-Teacher Associations				
Receptions, Dances, etc		1,215	415	650
Reunions, Banquets, etc			125	
School Nurses' Meetings				
Total Attendance	195	1,433	540	3,954

ACTIVITIES, 1921–22.

Dorchester High School.	East Boston High School.	English High School.	Girls' High School.	High School of Commerce.	Hyde Park High School.
Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
.....	.....	.....	460	210	80
.....	75	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	103	316	.....	496
.....	.....	.....	.....	.....	.....
.....	.....	.....	172	249	.....
.....	.....	.....	.....	.....	.....
.....	.....	24	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
200	450	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
1,000	110	.....	775	.....	.....
.....	.....	.....	.....	235	.....
1,200	635	127	1,723	694	576

Boston Trade School.	Abraham Lincoln School.	Agassiz School.	Blackinton School.	Bowditch School.	Benjamin Dean School.
Total Attendance.	Total Attendance	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
81	.....	.....	.....	450	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	1,077	33	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	391	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	345	247	215	.....
125	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....
.....	439	.....	.....	.....	.....
206	830	345	1,324	698	104

NON-SCHOOL CENTER

Activities.	Brimmer School.	Bowdoin School.	Charles Sumner School.	Comins School.	Christopher Gibson School.
	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
Boy Scout Troops			130		1,344
Entertainments					
Extension Courses	2,357				
Improvement Associations				150	
Parent-Teacher Associations					
Reunions, Banquets, etc		125			
Total Attendance	2,357	125	130	150	1,344

Activities.	Gilbert Stuart School.	George T. Angell School.	Hancock School.	Henry L. Pierce School.
	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
Alumni and Alumnæ Meetings			70	
Boy Scout Troops				636
Entertainments		255		
Improvement Associations	150			
Memorial Day Exercises				
Parent-Teacher Associations	156			
Receptions, Dances, etc				
Total Attendance	306	255	70	636

Activities.	John D. Philbrick School.	John Winthrop School.	Lewis School.	Longfellow School.	Lowell School.
	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
American Legion Meetings					200
Boy Scout Troops				73	
Girl Scout Troops					
Improvement Associations					
Parent-Teacher Associations	1,803	955		226	
Receptions, Dances, etc	180	393			
Reunions, Banquets, etc			63		
Total Attendance	1,983	1,348	63	299	200

ACTIVITIES, 1921–22.— *Continued.*

Dudley School.	Edmund P. Tileston School.	Elihu Greenwood School.	Farragut School.	Fairmount School.	Francis Parkman School.	Frothingham School.
Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
.....	566	.....	.....	.....	.....	.....
450	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	1,000
.....	633	552	192	130	1,355	.....
.....	.....	.....	.....	.....	.....	.....
450	1,199	552	192	130	1,355	1,000

Hillside School.	Hugh O'Brien School.	James A. McDonald School.	Jefferson School.	John A. Andrew School.	John Cheverus School.
Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
75	.....	.....	.....	.....	.....
.....	636	.....	.....	86	612
.....	.....	.....	.....	.....	.....
.....	.....	650	.....	.....	.....
.....	.....	.....	.....	500	.....
.....	1,842	.....	.....	.....	1,065
.....	.....	.....	34	.....	.....
75	2,478	650	34	586	1,677

Martin School.	Mary Hemenway School.	Mather School.	Michael Angelo School.	Minot School.	Oliver W. Holmes School.	Pauline A. Shaw School.
Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
.....	.....	150	.....	.....	1,342	.....
.....	190	.....	129	.....	453	.....
.....	.....	.....	.....	.....	.....	119
.....	400	.....	.....	.....	.....	.....
400	.....	.....	.....	330	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
400	590	150	129	330	1,795	119

NON–SCHOOL CENTER

Activities.	Phillips Brooks School.	Quincy School.
	Total Attendance.	Total Attendance.
American Legion Meetings		
Boy Scout Troops		463
Entertainments		
Improvement Associations		
Parent–Teacher Associations	529	
Reunions, Banquets, etc		
Total Attendance	529	463

Activities.	Thomas N. Hart School.	Trescott School.
	Total Attendance.	Total Attendance.
Boy Scout Troops	803	247
Committee Meetings and Conferences		
Election Officer's Meetings	174	
Improvement Associations		
Parent–Teacher Associations		821
Receptions, Dances, etc		
Total Attendance	977	1,068

ACTIVITIES, 1921–22.— *Concluded.*

Rice School.	Robert Gould Shaw School.	Roger Wolcott School.	Samuel Adams School.	Sarah Greenwood School.	Sherwin School.
Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
.....	786	.....	.....	.....	.....
.....	859	25	1,241	55	690
.....	100	.....	.....	.....	.....
75	1,755	.....	.....	165	.....
.....	332	2,210	.....	.....	.....
.....	71	.....	85	.....	.....
75	3,903	2,235	1,326	220	690

Ulysses S. Grant School.	Washington Allston School.	Warren School.	Wells School.	William E. Russell School.	William Lloyd Garrison School.
Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
285	.....	.....	.....	442	49
.....	.....	.....	10	.....	.....
.....	.....	.....	.....	.....	.....
.....	.....	250	.....	.....	.....
275	409	.....	.....	.....	.....
800	.....	.....	.....	.....	.....
1,360	409	250	10	442	49

ADDITIONAL USE OF SCHOOL PREMISES

Activities.	Normal School.	Girls' Latin School.	Public Latin School.	Brighton High School.	Charlestown High School.
	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
Aleppo Temple Groups					
Basketball (Young Men)	10				
Basketball (Young Women)					
Basketball and Dancing	4,255				
Bazaars		1,200		250	
Boy Scout Troops				300	
Boston League of Women Voters		75			
Children's Parties					1,800
Civil Service Examinations			2,298		
Club Meetings (Teachers')	60	176			
Concerts, Lectures and Entertainments	600	652		1,550	
Dancing (Folk)	943				
Girl Scout Troops	400				
Mass Meetings		500			
Political Rallies				1,000	2,300
Receptions and Dances	1,300	1,225			
Rehearsals		65			
Reunions, Banquets, etc	367	142			450
Trade Union College Classes					
Whist and Dancing	2,475	150			
Whist					
Total Attendance	10,410	4,185	2,298	3,100	4,550

Activities.	Roxbury High School.	South Boston High School.	West Roxbury High School.	Boston Trade School.	Abraham Lincoln School.	Agassiz School.
	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance
Basketball (Young Men)	15					
Basketball and Dancing	7,725	525	800			
Bazaars	750					
Boy Scout Troops						

BY OUTSIDE GROUPS, 1921–22.

Dorchester High School.	East Boston High School.	English High School.	Girls' High School.	High School of Commerce.	Hyde Park High School.	High School of Practical Arts.
Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
.....	.....	500	.....	.....	.....	.....
.....	.....	.....	700	.....	.....	.....
.....	.....	.....	288	.....	.....	.....
300	.....	.....	2,950	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
800	.....	.....	.....	.....	.....	.....
.....	.....	326	.....	.....	.....	.....
.....	.....	152	.....	.....	213	65
315	650	.....	3,420	500	.....	900
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
125	.....	.....	.....	.....	.....	.....
4,122	1,100	.....	.....	.....	.....	560
260	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
1,302	.....	.....	.....	.....	.....	.....
.....	.....	563	.....	.....	.....	.....
.....	.....	.....	300	.....	.....	.....
.....	.....	.....	.....	.....	135	.....
7,224	1,750	1,541	7,658	500	348	1,525

Audubon School.	Andrews School.	Blackinton School.	Bunker Hill School.	Bowditch School.	Chapman School.	Charles C. Perkins School.
Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	200	.....	.....

ADDITIONAL USE OF SCHOOL PREMISES

Activities.	Roxbury High School.	South Boston High School.	West Roxbury High School.	Boston Trade School.	Abraham Lincoln School.	Agassiz School.
	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
Club Meetings (Teachers')	150				570	
Concerts, Lectures and Entertainments			600			100
Floral Emblem Society					5,009	
Mass Meetings						500
Political Rallies	2,195	1,100		800	1,200	1,972
Receptions and Dances			970			
Rehearsals						
Reunions, Banquets, etc				150		
Total Attendance	10,835	1,625	2,370	950	6,779	2,572

Activities.	Christopher Gibson School.	Comins School.	Dorchester Avenue School.	Edmund P. Tileston School.	Elihu Greenwood School.
	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
American Legion Entertainments			1,000		
Boy Scout Troops				250	
Boston League of Women Voters					
Club Meetings (Teachers')					
Concerts, Lectures and Entertainments				1,330	
Girl Scout Troops				950	
Mass Meetings					
Political Rallies	50	1,900		650	75
Receptions and Dances					
Rehearsals				12	
Reunions, Banquets, etc					
Summer Schools					
Whist					
Total Attendance	50	1,900	1,000	3,912	75

BY OUTSIDE GROUPS, 1921–22.— *Continued.*

Audubon School.	Andrews School.	Blackinton School.	Bunker Hill School.	Bowditch School.	Chapman School.	Charles C. Perkins School.
Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
.....	.....	.....	.....	.....	.....	.....
575	5,450	375	.....	450	250	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	1,950	800	1 020	.....	200
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	150	.....	.....
.....	.....	.....	.....	.....	.....	.....
575	5,450	2,325	800	1,820	250	200

Edward Everett School.	Everett School.	Francis Parkman School.	Frederic W. Lincoln School.	Frothingham School.	George Frisbie Hoar School.	Gilbert Stuart School.
Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	300
.....	.....	.....	.....	.....	.....	150
.....	185	.....	.....	.....	.....	.....
200	.....	1,136	.....	250	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	2,240	.....	.....
200	.....	950	.....	1,300	.....	1,596
.....	.....	150	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	600	.....	400
.....	.....	.....	1,073	.....	9,822	.....
.....	.....	482	.....	.....	.....	.....
400	185	2,718	1,073	4,390	9,822	2,446

ADDITIONAL USE OF SCHOOL PREMISES

Activities.	George Putnam School.	Hyde School.	Hugh O'Brien School.	Henry L. Pierce School.	John A. Andrew School.	James Otis School.
	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
Boy Scout Troops					63	
Concerts, Lectures and Entertainments	150			385	300	2,700
Political Rallies			2,050	1,104	1,750	
Rehearsals						
Reunions, Banquets, etc						
Summer Schools		2,675				
Whist and Dancing						
Total Attendance	150	2,675	2,050	1,489	2,113	2,700

Activities.	Mary Hemenway School.	Mather School.	Michael Angelo School.	Minot School.	Oliver Hazard Perry School.	Oliver Wendell Holmes School.
	Total Attendance.	Total Attendance.	Total Attendance	Total Attendance.	Total Attendance.	Total Attendance.
American Legion Entertainments						
Boy Scout Troops						
Concerts, Lectures and Entertainments				45		
Dancing (Folk)						
Girl Scout Troops						
Mass Meetings	62	175				
Political Rallies	3,220	3,550	2,850		600	1,450
Summer Schools						
Zionist Motion Pictures						
Total Attendance	3,282	3,725	2,850	45	600	1,450

Activities.	Sarah Greenwood School.	Shurtleff School.	Thomas N. Hart School.	Trescott School.	Thomas Gardner School.	Ulysses S. Grant School.
	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
American Legion Entertainments						
Concerts, Lectures and Entertainments	700	2,664		72	556	
Mass Meetings	300					
Political Rallies	2,075	1,975	9	37	1,330	
Receptions and Dances						265
Summer Schools						
Total Attendance	3,075	4,239	9	109	1,886	265

BY OUTSIDE GROUPS, 1921-22.—*Concluded.*

John Cheverus School.	John D. Philbrick School.	John Marshall School.	John Winthrop School.	Lafayette School.	Lowell School.	Martin School.
Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
350		1,350	400		500	285
1,700	350		255		3,650	850
				20		
					450	
	550					
2,050	900	1,350	655	20	4,600	1,135

Phillips Brooks School.	Prince School.	Quincy School.	Rice School.	Robert Gould Shaw School.	Roger Wolcott School.	Samuel Adams School.	Sherwin School.
Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
				500			
		35			9		
5,510				431	950	500	
				70			
						450	
			500				
	400		750	1,525	700	600	1,200
		2,489					
					95		
5,510	400	2,524	1,250	2,526	1,754	1,550	1,200

Theodore Lyman School.	Washington School.	Washington Allston School.	Wells School.	Wendell Phillips School.	William Blackstone School.	William E. Russell School.
Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.	Total Attendance.
						925
1,350					5,325	400
						250
	150	800		900	1,500	5,200
	110					
			79			
1,350	260	800	79	900	6,825	6,775

WORKERS EMPLOYED — BOSTON SCHOOL CENTERS.

Titles.	Charlestown High School Center.	Dorchester High School Center.	East Boston High School Center.	English High School Center.	Michael Angelo School Center.	Roxbury Practical Arts High School Center.	Sarah Greenwood School Center.	South Boston High School Center.	William Blackstone School Center.	Totals.
Managers	.....	.....	1	†	1	.....	1	1	1	5
Associate Managers	1	1	*1	.....	.....	1	.....	.....	.....	4
Orchestra Leaders	.....	.....	1	.....	.....	1	1	.....	.....	3
Song Leaders	.....	.....	.....	.....	.....	.....	1	.....	.....	1
Special Leaders	.....	1	.....	1	.....	1	.....	.....	.....	3
Club Leaders	.....	2	5	.....	2	4	.....	1	.....	14
General Helpers	2	2	3	1	1	1	1	.....	2	13
Auditorium Leaders	.....	.....	.....	.....	1	.....	.....	.....	.....	1
Operators	2	3	3	1	2	3	3	3	2	22
Leaders	2	4	1	.....	5	5	3	3	1	24
Gymnasium Leaders	2	.....	1	1	.....	2	.....	.....	.....	6
General Pianists	.....	2	.....	.....	.....	.....	.....	.....	.....	2
Doormen	1	.....	.....	1	2	.....	.....	2	.....	6
Matrons	.....	1	.....	.....	1	1	1	.....	.....	4
Helpers	5	13	6	7	4	6	9	6	3	59
Pianists	3	1	2	1	2	4	1	3	1	18

Assistant Club Leaders	1					3		1		5
Attendants	1	2	5		2	4		2	1	17
Assistant Gymnasium Leaders			2							2
Assistant Helpers						2				2
Totals	20	32	31	13	23	38	21	22	11	‡211

* The Associate Manager of the East Boston High School Center also served as conductor of the Boston Home and School Association.
† A General Helper managed the English High School Center.
‡ Some workers served in more than one Center: the actual number of paid workers, therefore, was only 159. There were 145 volunteer workers served in the different Centers.

THE FOLLOWING TABLE IS A RECORD OF THE NUMBER OF CERTIFICATES ISSUED TO WORKING CHILDREN AND YOUNG PEOPLE FOR TWO YEARS UNDER THE ACTS OF 1913, CHAPTER 779.

Month	Employment Certificates.				Educational Certificates							
					Evening School Attendance not required.				Evening School Attendance compulsory.			
	1920–21.		1921–22.		1920–21.		1921–22.		1920–1921.		1921–22.	
	New Certificates.	Re-Issues.	New Certificates.	Re-Issues.	New Certificates.	Re-Issues.	New Certificates.	Re-Issues.	New Certificates.	Re-Issues.	New Certificates.	Re-Issues.
September	743	1,958	597	885	855	1,852	826	1,298	73	65	109	89
October	361	989	317	483	700	1,551	809	1,199	103	81	156	78
November	278	508	206	375	625	1,181	635	947	87	36	172	64
December	128	237	142	285	541	643	521	730	38	22	76	41
January	120	359	135	336	644	730	544	800	73	108	102	52
February	96	363	102	260	617	756	696	849	42	34	57	43
March	150	490	189	349	745	995	619	881	90	47	110	61
April	124	399	139	250	507	822	398	792	72	35	62	47
May	133	406	186	350	439	840	518	1,195	70	36	55	43
June	497	379	768	341	770	1,125	1,054	1,297	77	39	47	47
July	374	196	574	172	673	870	977	1,159	48	29	51	68
August	322	259	462	274	675	1,186	715	1,193	75	54	59	69
Totals	3,326	6,543	3,817	4,360	7,811	12,621	8,312	12,337	848	586	1,047	702

REGISTRATION OF MINORS.

April 1, 1922.

Group	Enrollment of Pupils					
	5 to 7 Years		7 to 14 Years		14 to 16 Years	
	Males	Females	Males	Females	Males	Females
Boston public schools	9,380	8,997	36,529	34,139	11,947	11,329
Private schools	71	103	292	299	198	242
Business schools				2	8	44
Parochial schools	2,079	2,329	8,564	10,201	1,208	1,204
Schools outside of Boston	9	3	219	205	138	84
Charitable institutions	4	6	12	6	2	3
Institutions for educational and custodial purposes	45	73	377	330	21	30
Physically or mentally defective children not enrolled in any school	5	3	36	30	10	12
Special home permits					137	104
Day School for Immigrants					9	5
Grand totals	11,544	11,454	46,029	45,112	12,740	12,742
Illiterate minors					(16 to 20 yrs.) 1,284	854

RETURN IN 4 WEEKS

s379.74 B65a 1922
Boston School Committee.
Documents. Report
for year 1922

s379.74 B65a 1922